State of California
The Resources Agency
Department of Water Resources

RECREATION SURVEYS

DRAFT

R-13

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R-13

Oroville Facilities Relicensing
FERC Project No. 2100

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This report was prepared to summarize information collected under the Study Plan composed to document attendance and other visitor characteristics at the recreation facilities associated with the Oroville Facilities of the State Water Project. This report has received only limited review; it is intended for use by the Recreation and Socioeconomics Work Group of the Oroville Facilities Relicensing Collaborative and should be considered preliminary and subject to revision.

Furthermore, this report was prepared under the general direction of DWR staff. Opinions, findings, and conclusions expressed in this report are those of the authors. This report does not express the official position of DWR unless specifically approved by the Director or his designee.

REPORT SUMMARY

This document presents the results of Study R-13 – *Recreation Surveys*, one of several recreation studies conducted by the California Department of Water Resources (DWR) to support the Oroville Facilities Relicensing (Federal Energy Regulatory Commission [FERC] Project No. 2100). This study presents the results of several extensive recreation surveys administered to gather recreation information useful toward evaluating recreation opportunities in the study area.

The Oroville Facilities were developed as part of the State Water Project (SWP), a water storage and delivery system of reservoirs, aqueducts, powerplants, and pumping plants that stores and distributes water to supplement the needs of urban and agricultural water users in California. The Oroville Facilities support a variety of recreational opportunities, including several types of boating and fishing, camping, picnicking, swimming, horseback riding, hiking, bicycling, and hunting.

NEED FOR THIS STUDY

This study is needed to meet FERC direction regarding preparation of comprehensive recreation plans: FERC regulations state that a "well documented user survey is an essential part of a good recreation plan" (FERC 1996).

STUDY OBJECTIVE

The objectives of this study are to determine Project area recreationists' background characteristics (visitors' activities, trip characteristics, and socio-demographic characteristics); user preferences for facility and area development; perceptions of crowding; levels of satisfaction; reasons for visiting the area; and reasons for not visiting the area. Obtaining characteristics and recreation preferences of Northern California households and users of similar sites, especially as they relate to the study area, was also an objective of this study.

METHODOLOGY

Several surveys were administered for this study:

- A Lake Oroville Area Recreation Visitor Survey (consisting of an On-Site Survey with some optional activity-specific sections and a follow-up Mailback Survey);
- A Hunter Survey (also consisting of both an On-Site Survey and a follow-up Mailback Survey);
- A Similar Site Survey, administered at three reservoirs in Northern California deemed similar to the Lake Oroville area in terms of recreational opportunities; and

- A Household Survey, consisting of telephone interviews with residents of Butte County, as well as three other Northern California and Nevada market areas.

The purpose of the Lake Oroville Area Recreation Visitor On-Site Survey was to obtain information about visitors' pattern of past use of the study area, their current visit, and their perceptions and opinions regarding a range of conditions and factors that could affect their enjoyment. The Mailback Survey was implemented as a follow-up to the On-Site Survey and was primarily used to obtain information on visitors' recreation spending associated with their Lake Oroville area visit, and additional descriptive, perception, and opinion information.

The On-Site Survey was a self-administered survey completed by both day and overnight visitors engaged in recreation activities in the study area. Besides the general questions, there were three activity-specific sections for anglers, boaters, and trail users, which were skipped by people who were not or did not expect to fish, boat, or use trails. A version of the survey booklet intended to be left on visitors' windshields was also prepared. The Mailback Survey was similar in length to the On-Site Survey but had many multiple-part questions which were generally in "check-off" form to be less burdensome to the respondent, and more easily evaluated.

For the On-Site Survey, sampling protocols were developed to ensure representation from several major target recreational groups. The On-Site Survey was administered at 44 sites over a 12-month period starting from Memorial Day weekend, 2002 and ending after Memorial Day weekend, 2003. Four-hour sampling periods were scheduled on a monthly basis using a stratified random sampling design with stratification by day of week (weekend vs. weekday) and time of day.

Survey protocol for the On-Site Survey included surveyors approaching visitors and giving a brief introduction to the survey. With exceptions at a few sites, visitors must have been recreating at the site where they were contacted for at least 30 minutes to be included in the survey. The Mailback Survey was mailed 7 to 10 days after the original On-Site Survey contact. Butte County residents and non-residents were sent slightly different surveys to better estimate economic impacts. A total of 2,583 people completed the On-Site Survey and 1,071 people completed the Mailback Survey (some unusable surveys were discarded).

The Hunter Survey assessed hunters' use patterns, attitudes, and perceptions specific to the hunting experience, species hunted, and hunting locations. The survey was a self-administered booklet. A mail survey was also sent, for the most part identical in content to the surveys sent to non-hunter user groups. The Hunter Survey sampling schedule was from mid-October 2002 through January 2003 and included weekends only. There were a total of 106 on-site Hunter Surveys completed and 38 mailback surveys returned.

The Similar Site Survey was administered at Black Butte Lake, Lake Berryessa, and Shasta Lake, all three of which are large, federally-managed reservoirs that offer water-based recreation opportunities similar to Lake Oroville. The purpose of this survey was to determine how visitors to other reservoirs in the Northern California region perceived conditions and rated their experiences at those sites, which could provide some means to compare similar information provided by Lake Oroville area visitors. The Similar Site Survey combined relevant aspects of the On-Site and Mailback Survey instruments in a single on-site survey booklet. Sampling occurred on at least two weekend days in July and August 2002 at each site. A total of 293 Similar Site Surveys were completed.

The Household Survey was designed to identify latent demand among Northern Californian and Reno area residents for special events and facilities in the Lake Oroville area, and to assess potential factors influencing why residents might not be visiting the Lake Oroville area. There were 100 respondents from each of four strata: Butte County, Reno area, San Francisco area, and Sacramento area.

RESULTS AND DISCUSSION

Rather than attempt to summarize the extensive and detailed results of the surveys here (as provided in Section 6.0 of this report), this section will instead describe the general benefits and areas of knowledge gained from each of the four survey efforts provided in this report.

Lake Oroville Area Recreation Visitor Survey

The Lake Oroville Area Recreation Visitor Survey was successful in obtaining a statistically valid representation of study area visitor characteristics, use patterns, opinions, perceptions, and preferences. Specifically, the data describes visitors to the study area as a whole and visitors to specific subareas (termed for this report “resource areas”) in terms of how long they stay in the area when they visit, whether they stay overnight or not, how often they visit and during what seasons, what portions of the study area they tend to use, the size and composition of the groups they visit with, and the activities they participate in while in the study area. All of these data provide a picture of the types of visitors and activities the study area serves, and an indication of what overall recreation management and development needs are required to serve them.

Specific perceptions that have been explored and are statistically represented by the survey include perceptions of crowding at specific recreation sites, perceptions of the quality or appeal of scenery at specific recreation sites, perceptions of the adequacy of several types of recreation facilities (in terms of the number provided), and perceptions of whether several management issues and resource and social conditions were problems in the area.

Generally, visitors have little concern about crowding at most sites, and most consider the number of facilities of various types to be adequate, and most management issues to be "slight" problems, at most. However, the data reveal those facilities and management issues of most concern to certain users, and thus provide guidance for potential future actions to address these.

Another major area of information obtained relates to visitors' specific preferences and desires related to the study area. These include preferences for different social and physical aspects of the recreation setting, and preferences for new special events and facility enhancements or additions. The data provide background information to be considered in planning future recreation enhancements, and allow for some ranking or prioritization of these potential changes, based on level of visitor interest.

A substantial amount of information specific to several key user groups was also obtained. From anglers, this includes data on frequency of angling use, use of guide services and participation in tournaments, fish species pursued and caught/released, perceptions of fishing regulations, satisfaction with their fishing experience, and reasons for dissatisfaction. From trail users, this included characterization of primary type of trail use (hike, bike, equestrian), perceptions of crowding on trails, encounters of concern with other trail users, and satisfaction with trail condition. From reservoir boaters information was obtained about the portions of the study area where they boat, encounters on the water and observation of boating activity of concern, perceptions of crowding on the water, types of watercraft used, use of boat ramps, experiences with waiting to use ramps, satisfaction with their boating experience, and reasons for dissatisfaction. As a whole, the data from these user groups indicate their satisfaction is fairly high, but their perceptions of problems or inadequacies and perceived priorities for improvements are also evident.

Finally, data were obtained on visitors' overall satisfaction with their visits to the study area and several hundred comments were obtained from visitors about their positive and negative perceptions of the area, changes they believe are needed, and many other topics. Overall, satisfaction with visits to the Lake Oroville was high, but the survey data reveal key issues that might potentially be addressed to enhance satisfaction.

Some key comparisons of these characteristics and perceptions were made in the report, in addition to comparisons across resource areas. These include comparisons of peak season vs. non-peak season visitors, local (residents of Butte and adjacent Counties) vs. non-local visitors, and by general activity-based user groups (i.e., boaters vs. trail users vs. anglers, etc.).

Hunter Survey

The Hunter Survey provided a statistically valid (for most questions) representation of OWA hunters' overall hunting use patterns, characteristics of their hunting trip including length of stay and group size, and the species of wildlife hunted for and amount of game taken. Hunter data obtained include perceptions of crowding while hunting, access to the OWA, study area hunting regulations, adequacy of facilities, perceptions of whether several management issues and resource and social conditions were problems in the OWA, and improvements desired for hunting in the OWA. Lastly, data were obtained on hunters' level of satisfaction with hunting in the OWA and causes for dissatisfaction. Hunter satisfaction was reasonably high, but the data provide details on several specific issues that hunters would most like addressed to improve hunting.

Similar Site Survey

The Similar Site Survey provides, through what may be termed an "indicator sample" (much smaller samples than obtained in the study area in a very limited sampling period), a useful indication of the perceptions of visitors to several other northern California reservoirs of the sites and boating conditions there. This information is useful as a source of context and comparison with similar perceptions gaged at the Lake Oroville area. This Survey also collected information from users of those other reservoirs about their frequency of use and perceptions of Lake Oroville, if they had ever visited there, and their interest in special events and facility additions as potential motivations to visit the area (if they had never visited). As with the Lake Oroville Area Visitor Survey, these data allow for some ranking or prioritization of potential management actions and enhancements to the area based on level of visitor (or potential visitor) interest.

Household Survey

The Household Survey, like the Similar Site Survey, relied on samples of about 100 respondents per sampling stratum, thus the data may not provide statistically valid representation for individual questions or issues with low response rates. Nevertheless, the Household Survey data provides an indication of regional residents' use and perceptions of the Lake Oroville area. The data indicate that those who did not live in the immediate area were not frequent visitors to the area, but that the reasons for this had more to do with distance, travel time, and other water-based recreation opportunities closer to their homes rather than with perceived inadequacies or characteristics of the study area. The data further suggest that certain types of special events and facilities have more potential than others to increase visitation by these regional residents, providing additional guidance in planning and prioritizing such actions.

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ACRONYMS AND ABBREVIATIONS

af	acre-feet
ATV	all-terrain vehicle
BR	boat ramp
CFR	Code of Federal Regulations
cfs	cubic feet per second
DFG	California Department of Fish and Game
DPR	California Department of Parks and Recreation
DUA	Day Use Area
DWR	California Department of Water Resources
FERC	Federal Energy Regulatory Commission
FRSA	Feather River Service Area
ISO	Independent System Operator
LFC	Low Flow Channel
LOSRA	Lake Oroville State Recreation Area
maf	million acre-feet
msl	mean sea level
MW	megawatts
NF	National Forest
NOAA	National Oceanic and Atmospheric Administration
OHV	Off-Highway Vehicle
ORV	off-road vehicle
OWA	Oroville Wildlife Area
PWC	personal watercraft
RV	recreational vehicle
SR	State Route
SVRA	State Vehicular Recreation Area
SWP	State Water Project
TA	Trailhead Access
USACE	U.S. Army Corps of Engineers

1.0 INTRODUCTION

The California Department of Water Resources (DWR) operates the Oroville Facilities, a multipurpose water supply, flood management, power generation, fish and wildlife enhancement and recreation project. The hydroelectric facilities operate under a license from the Federal Energy Regulatory Commission (FERC), which expires on January 31, 2007. Pursuant to the Federal Power Act, DWR is required to file an application for a new license on or before January 31, 2005.

This document presents the results of the Recreation Survey (R-13), one of several recreation studies conducted for the Oroville Facilities Relicensing Project (FERC Project No. 2100). Recreation surveys are an integral part of most hydropower relicensing recreation studies; for this Project, they are also being used to collect information addressing the objectives of many of the 19 different recreation and socioeconomic studies. These surveys gather recreation use information, perceptions of crowding and safety issues, recreation preferences, overall trip satisfaction, and economic expenditure information from reservoir boaters, anglers, and trail users, for both day use and overnight visitors.

1.1 BACKGROUND INFORMATION

Lake Oroville offers a variety of existing recreational facilities and opportunities such as camping, boating, and fishing. Camping facilities range from developed campgrounds to primitive sites. There are three large developed campgrounds, two group campgrounds, and one equestrian campground as well as three primitive camping areas and two recreation vehicle (RV) “en route” camping areas. Boat-in campsites and floating campsites offer unique recreation opportunities. Other boating facilities include two full-service marinas, nine boat ramps, six car-top boat ramps, and seven floating toilets. Popular on-water activities in the Lake Oroville area include houseboating, motor boating, waterskiing, wake boarding, and personal watercraft (PWC) use, as well as some sailing, canoeing, kayaking, and windsurfing opportunities. Other recreation opportunities in the Lake Oroville area include picnicking, swimming, horseback riding, hiking, off-road biking, wildlife watching, off-road vehicle (ORV) and off-highway vehicle (OHV) use, and hunting. There is also a visitor center located near the reservoir. Several fishing tournaments are held at the reservoir, and there are excellent fishing opportunities both on the reservoir and on the Feather River below Oroville Dam. The Feather River Fish Hatchery, located below the Diversion Dam along the “Low Flow Channel,” offers fish-viewing opportunities with tours and educational signage.

Additional recreational facilities are located at the Thermalito Forebay, Thermalito Afterbay, Thermalito Diversion Pool, and Oroville Wildlife Area (OWA). The Thermalito Forebay offers two day use areas, two boat ramps, an aquatic center, extensive picnicking facilities, and a swimming area and beach. The Thermalito Afterbay offers two boat ramps, a car-top boat ramp, a PWC/swimming beach, and hunting

opportunities, as well as many opportunities to hike or bike on trails surrounding the Afterbay. The Diversion Pool offers a day use area, non-motorized boating, and many multiple-use trail opportunities. The OWA encompasses parts of the Feather River below Highway 162 and provides opportunities for hunting, fishing, primitive camping, river boating, target shooting, and wildlife watching.

1.2 STUDY AREA

The study area for R-13 includes the Project area; three regional reservoirs; Butte County and three metropolitan areas: Sacramento, San Francisco, and Reno; and the lands and waters within and adjacent to (1/4 mile) the FERC Project boundary, and adjacent lands, facilities, and roads (Figure 1.2-1). The Project area includes all lands within the FERC Project 2100 boundary and for the purposes of this study is divided into five geographic resource areas: Lake Oroville, Diversion Pool, Thermalito Forebay, Thermalito Afterbay, Low Flow Channel (LFC), and the OWA.

1.3 DESCRIPTION OF FACILITIES

The Oroville Facilities are located on the Feather River at the foothills of the Sierra Nevada in Butte County, California. The Oroville Facilities were developed as part of the State Water Project (SWP), a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants. The main purpose of the SWP is to store and distribute water to supplement the needs of urban and agricultural water users in Northern California, the San Francisco Bay area, the San Joaquin Valley, and Southern California. The Oroville Facilities are also operated for flood control, power generation, to improve water quality in the Sacramento–San Joaquin Delta (Delta), enhance fish and wildlife, and provide recreation.

FERC Project No. 2100 encompasses 41,100 acres and includes Oroville Dam and Reservoir, three power plants (Hyatt Pumping-Generating Plant, Thermalito Diversion Dam Power Plant, and Thermalito Pumping-Generating Plant), Thermalito Diversion Dam, the Feather River Fish Hatchery and Fish Barrier Dam, Thermalito Power Canal, the OWA, Thermalito Forebay and Forebay Dam, Thermalito Afterbay and Afterbay Dam, transmission lines, and a relatively large number of recreational facilities. An overview of these facilities is provided in Figure 1.2-1. Oroville Dam, along with two small saddle dams, impounds Lake Oroville, a 3.5-million-acre-foot (maf) capacity storage reservoir with a surface area of 15,810 acres at its maximum normal operating level of 900 feet above mean sea level (msl).

The hydroelectric facilities have a combined licensed generating capacity of approximately 762 megawatts (MW). The Hyatt Pumping-Generating Plant is the largest of the 3 power plants with a capacity of 645 MW.

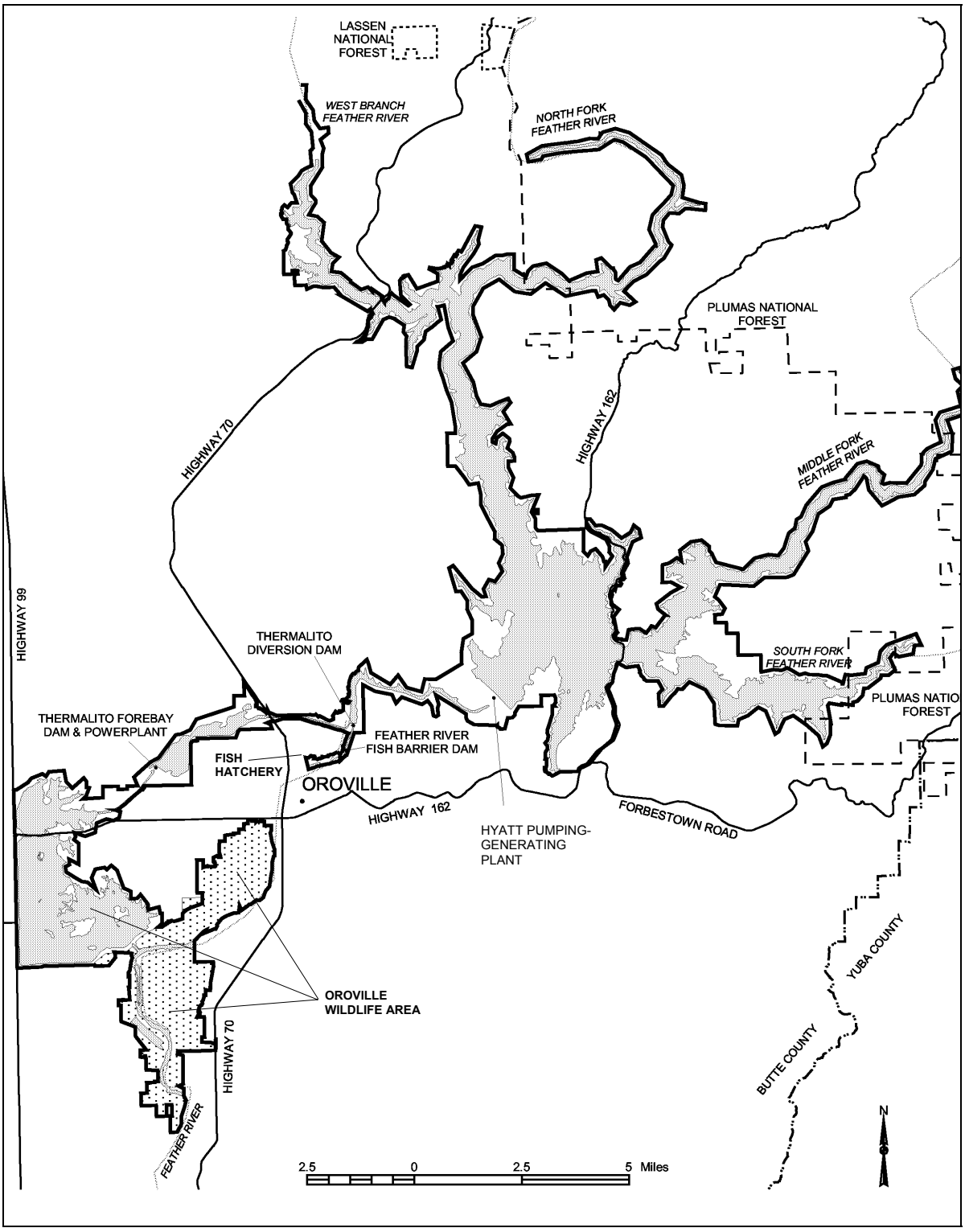

Figure 1.2-1. Oroville Facilities FERC Project 2100 Boundary.

Water from the six-unit underground power plant (three conventional generating and three pumping-generating units) is discharged through two tunnels into the Feather River just downstream of Oroville Dam. The plant has a generating and pumping flow capacity of 16,950 and 5,610 cubic feet per second (cfs), respectively. Other generation facilities include the 3-MW Thermalito Diversion Dam Power Plant and the 114-MW Thermalito Pumping-Generating Plant.

Thermalito Diversion Dam, 4 miles downstream of Oroville Dam, creates a tail water pool for the Hyatt Pumping-Generating Plant and is used to divert water into the Thermalito Power Canal. Thermalito Diversion Dam Power Plant is located on the left abutment of the diversion dam. The power plant releases a maximum of 615 cfs of water into the river.

The OWA comprises approximately 11,000 acres west of Oroville that are managed for wildlife habitat and recreational activities. It includes the Thermalito Afterbay and surrounding lands (approximately 6,000 acres), along with 5,000 acres adjoining the Feather River. The 5,000-acre area is adjacent to or straddles 12 miles of the Feather River and includes willow and cottonwood–lined ponds, islands, and channels. Recreational opportunities include dispersed recreation (hunting, fishing, and bird watching); recreational activities also take place at developed sites (the Monument Hill Day Use Area [DUA], model airplane grounds, and three boat launches on the Afterbay and two on the river) and in two primitive camping areas. The California Department of Fish and Game's (DFG's) habitat enhancement program includes a wood duck nest-box program and dry land farming for nesting cover and improved wildlife forage. Limited gravel extraction also occurs in a few locations.

1.4 CURRENT OPERATIONAL CONSTRAINTS

Operation of the Oroville Facilities varies seasonally, weekly, and hourly, depending on hydrology and the objectives DWR is trying to meet. Typically, releases to the Feather River are managed to conserve water while meeting a variety of water delivery requirements, including flow, temperature, fisheries, diversion, and water quality. Lake Oroville stores winter and spring runoff for release to the Feather River as necessary for Project purposes. Meeting the water supply objectives of the SWP has always been the primary consideration for determining Oroville Facilities operation (within the regulatory constraints specified for flood control, instream fisheries, and downstream uses). Power production is scheduled within the boundaries specified by the water operations criteria noted above. Annual operations planning is conducted for multi-year carryover storage. The current methodology is to retain half of the Lake Oroville storage above a specific level for subsequent years. Currently, that level has been established at 1.0 maf; however, this does not limit drawdown of the reservoir below that level. If hydrology is drier or requirements are greater than expected, additional water could be released from Lake Oroville. The operations plan is updated regularly to reflect forecast changes in hydrology and downstream operations. Typically, Lake Oroville is filled to its

maximum operating level of 900 feet above msl in June and then lowered as necessary to meet downstream requirements, to a minimum level in December or January (approximately 700 msl). During drier years, the reservoir may be drawn down more and may not fill to desired levels the following spring. Project operations are directly constrained by downstream operational demands and flood management criteria as described below.

1.4.1 Downstream Operation

An August 1983 agreement between DWR and DFG, entitled "Agreement Concerning the Operation of the Oroville Division of the State Water Project for Management of Fish & Wildlife" (DWR and DFG 1983) sets criteria and objectives for flow and temperatures in the low-flow channel and the reach of the Feather River between Thermalito Afterbay and Verona. This agreement: (1) establishes minimum flows between Thermalito Afterbay outlet and Verona that vary by water year type; (2) requires flow changes under 2,500 cfs to be reduced by no more than 200 cfs during any 24-hour period (except for flood management, failures, etc.); (3) requires flow stability during the peak of the fall-run Chinook salmon spawning season; and (4) sets an objective of suitable temperature conditions during the fall months for salmon and during the later spring/summer for shad and striped bass.

1.4.1.1 Instream Flow Requirements

The Oroville Facilities are operated to meet minimum flows in the Lower Feather River as established by the 1983 agreement (see above). The agreement specifies that the Oroville Facilities release a minimum of 600 cfs into the Feather River from the Thermalito Diversion Dam for fisheries purposes. This is the total volume of flows from the diversion dam outlet, diversion dam power plant, and the Feather River Fish Hatchery pipeline.

Generally, the instream flow requirements below Thermalito Afterbay are 1,700 cfs from October through March, and 1,000 cfs from April through September. However, if runoff for the previous April through July period is less than 1,942,000 acre-feet (af) (i.e., the 1911–1960 mean unimpaired runoff near Oroville), the minimum flow can be reduced to 1,200 cfs from October to February and 1,000 cfs for March. A maximum flow of 2,500 cfs is maintained from October 15 through November 30 to prevent spawning in overbank areas that might later become dewatered.

1.4.1.2 Temperature Requirements

The Thermalito Diversion Pool provides the water supply for the Feather River Fish Hatchery. The hatchery temperature objectives are 52°F for September, 51°F for October and November, 55°F for December through March, 51°F for April through May

15, 55°F for the last half of May, 56°F for June 1–15, 60°F for June 16 through August 15, and 58°F for August 16–31. In April through November, a temperature range of plus or minus 4°F is allowed for objectives.

There are several temperature objectives for the Feather River downstream of the Afterbay outlet. During the fall months, after September 15, the temperatures must be suitable for fall-run Chinook salmon. From May through August, the temperatures must be suitable for shad, striped bass, and other warmwater fish.

The National Oceanic and Atmospheric Administration (NOAA) Fisheries has also established an explicit criterion for steelhead trout and spring-run Chinook salmon, memorialized in a biological opinion on the effects of the Central Valley Project and the SWP on Central Valley spring-run Chinook and steelhead. As a reasonable and prudent measure, DWR attempts to control water temperature at Feather River mile 61.6 (Robinson's Riffle in the low-flow channel) from June 1 through September 30. This measure attempts to maintain water temperatures at less than or equal to 65°F on a daily average. The requirement is not intended to preclude pump-back operations at the Oroville Facilities needed to assist the State of California with supplying energy during periods when the California Independent System Operator (ISO) anticipates a Stage 2 or higher alert.

The hatchery and river water temperature objectives sometimes conflict with temperatures desired by agricultural diverters. Under existing agreements, DWR provides water for the Feather River Service Area (FRSA) contractors. The contractors claim a need for warmer water during spring and summer for rice germination and growth (i.e., minimum 65°F from approximately April through mid-May, and minimum 59°F during the remainder of the growing season), although there is no explicit obligation for DWR to meet the rice water temperature goals. However, to the extent practical, DWR does use its operational flexibility to accommodate the FRSA contractors' temperature goals.

1.4.1.3 Water Diversions

Monthly irrigation diversions of up to 190,000 af (July 2002) are made from the Thermalito Complex during the May through August irrigation season. The total annual entitlement of the Butte and Sutter County agricultural users is approximately 1.0 maf. After meeting these local demands, flows into the lower Feather River (and outside of the Project 2100 Boundary) continue into the Sacramento River and into the Delta. In the northwestern portion of the Delta, water is pumped into the North Bay Aqueduct. In the south Delta, water is diverted into Clifton Court Forebay, where the water is stored until it is pumped into the California Aqueduct.

1.4.1.4 Water Quality

Flows through the Delta are maintained to meet Bay-Delta water quality standards arising from DWR's water rights permits. These standards are designed to meet several water quality objectives such as salinity, Delta outflow, river flows, and export limits. The purpose of these objectives is to attain the highest reasonable water quality, considering all demands being made on Bay-Delta waters. In particular, they protect a wide range of fish and wildlife including Chinook salmon, Delta smelt, and striped bass, as well as the habitat of estuarine-dependent species.

1.4.2 Flood Management

The Oroville Facilities are an integral component of the flood management system for the Sacramento Valley. During the wintertime, the Oroville Facilities are operated under flood control requirements specified by the U.S. Army Corps of Engineers (USACE). Under these requirements, Lake Oroville is operated to maintain up to 750,000 af of storage space to allow for the capture of significant inflows. Flood control releases are based on the release schedule in the flood control diagram or the emergency spillway release diagram prepared by USACE, whichever requires the greater release. Decisions regarding such releases are made in consultation with USACE.

The flood control requirements are an example of multiple use of reservoir space. When flood management space is not required to accomplish flood management objectives, the reservoir space can be used for storing water. From October through March, the maximum allowable storage limit (the point at which specific flood releases would have to be made) varies from about 2.8 to 3.2 maf to ensure adequate space in Lake Oroville to handle floodflows. The actual encroachment demarcation is based on a wetness index, computed from accumulated basin precipitation. This allows higher levels in the reservoir when the prevailing hydrology is dry. When the wetness index is high in the basin (i.e., high potential runoff from the watershed above Lake Oroville), required flood management space is at its greatest to provide the necessary flood protection. From April through June, the maximum allowable storage limit is increased as the flooding potential decreases, which allows capture of the higher spring flows for use later in the year. During September, the maximum allowable storage decreases again to prepare for the next flood season. During flood events, actual storage may encroach into the flood reservation zone to prevent or minimize downstream flooding along the Feather River.

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2.0 NEED FOR STUDY

This study is needed to meet FERC direction regarding preparation of comprehensive recreation plans, and in doing so FERC regulations state that a "well documented user survey is an essential part of a good recreation plan" (FERC 1996). This study addresses Issue Statement R-1—adequacy of existing Project recreation facilities, opportunities, and access to accommodate current use and future demand. A recreation user survey is an effective tool in assisting with managing and planning recreation areas.

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3.0 STUDY OBJECTIVE

The objectives of this study are to determine recreation user background characteristics (visitors' activities, trip characteristics, and socio-demographic characteristics); preferences for facility and area development; perceptions of crowding; levels of satisfaction; and reasons for visiting the area. An additional objective was to determine perceptions of non-visitors who reside in the region and why they had not visited the study area.

More specific objectives include gaging latent demand for recreation activities in the Lake Oroville area and its relative importance compared to other similar recreation destinations in Northern California. Surveys of visitors to similar recreation sites at other Northern Californian reservoirs provide context and opportunity for comparison with Project area survey results. These also provide information on visitors to other sites' knowledge and opinions of the Project Area. A telephone survey of households within and outside Butte County was conducted to measure interest in recreation within the study area and in various development scenarios that may motivate them to visit the Study Area.

This study provided data for many of the other recreation studies conducted for relicensing, including:

- R-2 – Recreation Safety Assessment;
- R-3 – Assessment of the Relationship of Project Operations and Recreation;
- R-4 – Relationship Assessment of Fish/Wildlife Management;
- R-5 – Assessment of Recreation Areas Management;
- R-8 – Recreation Carrying Capacity;
- R-12 – Projected Recreation Use;
- R-14 – Assessment of Regional Recreation and Barriers to Recreation;
- R-16 – Whitewater and River Boating;
- R-17 – Recreation Needs Analysis; and
- R-18 – Recreation Activity, Spending, and Associated Economic Impacts.

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4.0 METHODOLOGY

This section describes the methodology of each of the surveys conducted for this study. Current recreation users of the study area were surveyed on-site at the study area and via a follow-up mailback survey. Additionally, data were collected on-site from recreationists at three other similar reservoirs in Northern California and from households in several parts of Northern California via a telephone survey. An activity-specific survey of hunters was used to obtain information from that user-group within the portion of the study area where most hunting occurs. A copy of each survey is presented in the appendices.

The following summarizes each of the surveys conducted:

- Lake Oroville Area Recreation Visitor Survey (On-Site and Mailback Surveys) – This survey targeted recreationists that visited Project area recreation facilities during a one-year period beginning May 2002 and included a direct contact questionnaire and version used for windshield distribution. Those respondents who provided their name and address were sent a follow-up survey in the mail asking for additional information.
- Hunter Survey – Hunters were surveyed within the Oroville Wildlife Area beginning in October 2002 using an on-site survey. A follow-up survey was mailed out to those who provided their name and mailing address as requested.
- Similar Site Survey – Recreationists at three Northern California reservoirs -- Lake Berryessa, Black Butte Lake and Shasta Lake -- were surveyed on-site during the 2002 peak season. No follow-up mail survey was used.
- Household Survey – A telephone survey was conducted of 400 Northern California and Nevada residents who recreate at lakes, reservoir, or rivers in the region. This survey was conducted during the summer of 2002.

Most results for the Lake Oroville Recreation Visitor Survey and complete results for the Hunter Survey, the Similar Sites Survey, and the Household Survey are presented in Section 5.0. Economics-related results from the Mailback Survey portion of the Lake Oroville Recreation Visitor Survey are presented in Study R18 – *Recreation Activity, Spending, and Associated Economic Impacts*.

4.1 SURVEYS PREVIOUSLY CONDUCTED WITHIN THE STUDY AREA

The most recent major visitor questionnaire study conducted for the study area was the 1996 study conducted by Guthrie et al. (1997). This study examined existing recreation use levels and asked visitors entering controlled access areas to complete a brief survey. This survey asked questions about: whether or not the trip was the first visit, specific activities in which visitors participated, length of stay, daily expenditures, visitors' residence locations, satisfaction with existing facilities, and desire for additional facilities and recreation opportunities. The study did not address crowding and carrying

capacity issues, nor did it provide or ask for a great deal of detail regarding satisfaction with the respondents' recreation visits to the study area.

The other major recreation study relevant to this effort is the 2002 DPR study entitled *Public Opinion and Attitudes on Outdoor Recreation in California*, one of a series of similar studies conducted periodically by the agency. The study queries visitors at a variety of state parks and state recreation areas (not including LOSRA within the study area). However, the major information collected is fairly broad and is intended to support state-level strategic planning rather than help assess opinions about specific management problems or study area development options.

4.2 LAKE OROVILLE AREA RECREATION VISITOR SURVEY (ON-SITE AND MAILBACK SURVEYS)

The largest and most comprehensive survey conducted for this study was the Lake Oroville Area Recreation Visitor Survey. Based on the two methodologies used in that effort, the survey is discussed under two titles: the On-Site Survey and Mailback Survey. The overall purpose of the On-Site Survey was to obtain information about visitors' pattern of past use of the study area, their current visit, and their perceptions and opinions regarding a range of conditions and factors that could affect their enjoyment. The Mailback Survey implemented as a follow-up to the On-Site Survey was primarily used to obtain information on visitors' recreation spending associated with their Lake Oroville area visit, but was also used to obtain additional descriptive, perception, and opinion information.

4.2.1 Survey Design

The On-Site Survey was designed as a self-administered survey in the form of a booklet to be completed by both day users and overnight visitors engaged in recreation activities offered in the study area. (A special survey instrument, described below, was designed for hunters.) The 13-page survey booklet elicited information on several general themes:

- Frequency and seasons of past use;
- Current trip characteristics (date of arrival and departure, group size, areas visited, overnight accommodations, activities participated in, etc.);
- Visitors' perceptions and opinions related to several topics (crowding, visual quality, encounters with others on the water or on trails, condition of trails, and fishing regulations);
- Visitors' satisfaction with their fishing and boating experience; and
- Demographic information (age, education, occupation, income, ethnicity).

Some of the above topics were addressed in three activity-specific sections for anglers, boaters, and trail users, along with other topics related to these three activities. Instructions at the start of each of these sections indicated that visitors should skip the section if they had not or did not expect to fish, boat, or use trails, respectively, during their current visit to the study area. A version of the survey booklet intended to be left on visitors' windshields was also prepared. The windshield survey was identical in content to the On-Site Survey but with a cover note introducing the survey and providing additional instructions that were normally given to visitors verbally on-site. Both instruments contained a map of the study area inside the front cover of the booklet with six Lake Oroville zones and six downstream portions of the study area numbered and labeled. Copies of the On-Site Survey and on-site windshield surveys are included in Appendix A.

The Mailback Survey booklet was similar in length to the On-Site Survey booklet, with 14 questions on 13 pages. The Mailback Survey was needed to accommodate the vast array of stakeholder issues and data needs, as a single questionnaire would have been too lengthy to implement on-site without excessively burdening visitors. Additionally, the recreation spending section of the Mailback Survey was more appropriate to respond to once a trip was completed. Several of the questions were multiple-part questions with several dozen individual items to be answered. Although the number of items to respond to was large, most were of the "check-off" form and therefore could be answered quickly. Most of the survey questions were to be answered specifically in reference to the respondents' recent trip to the Lake Oroville area during which they participated in the On-Site Survey. The introduction to the survey booklet reminded boaters about that particular "recent trip" by listing the date and location of their On-Site Survey.

The first three sections of the Mailback Survey were focused on recreation expenditures. These data were collected to meet the objectives of Study R-18 – *Recreation Spending and Economic Impacts*. Specifically, the first section of the survey asked respondents to describe the mode of transportation and accommodation used (the latter applied only if they stayed at least one night away from home on the trip). The second section asked respondents about their ownership, use on their recent trip, and recent expenditures related to 16 types of recreation equipment. The third section consisted of a large table in which respondents were asked to list their trip expenditures within five broad categories: lodging, food and beverages, transportation, activities/entertainment, and miscellaneous. Each of these categories was further divided into several sub-categories. The table allowed respondents to specify the community in which each expense occurred and whether the expenditures occurred while preparing for the trip, while traveling to and from the study area, or while on-site at the study area.

The last section of the survey was essentially a continuation of the On-Site Survey questions and was unrelated to expenses. The following topics were addressed in the section:

- Other Northern Californian places visited during the last 12 months and during their recent Lake Oroville area trip;
- New recreation activities and special events they would like to be available in the Lake Oroville area;
- Preferences for recreation settings in the Lake Oroville area;
- Perceptions of various management, water condition, and user interaction issues as problems in the Lake Oroville area;
- Perceptions of the number of various types of recreation facilities and services in the Lake Oroville area; and
- Overall satisfaction with their recent trip.

Similar to the on the On-Site Survey, respondents to the Mailback Survey were invited to write any additional comments they wished to express.

4.2.2 Survey Sampling Protocol

Sampling protocols were developed to ensure representation from several major target recreational groups. Efforts to determine which groups should be targeted, as well as how many completed surveys would constitute adequate representation, were discussed at length during the Study Plan development phase and again prior to beginning data collection in late May 2002. Several target groups, which were not mutually exclusive, were identified:

- Recreational visitors who visited the study area primarily for angling;
- Recreational visitors who visited the study area primarily for reservoir boating (day users and overnight visitors); and,
- Non-boating day use and overnight recreational visitors.

More specific visitor groups were targeted based on a list of 19 recreation activities believed to occur in the study area during a particular time of year (or year round). The 19 activities/locations/season groups are listed below in condensed form (12 activity groups) and by primary season of use:

Year-Round Recreation Use Groups

- Anglers at Lake Oroville, Afterbay, and Forebay
- Feather River anglers (with seasonal emphasis as appropriate)
- Trail users

Spring to Fall (April to October) Recreation Use Groups

- Swimmers at the Forebay
- Campers at the OWA
- Campers at the drive-in campsites on Lake Oroville
- Picnickers at Lake Oroville, Forebay, Afterbay, and Diversion Pool
- Other day users at Lake Oroville, Forebay, Afterbay, and Diversion Pool

Summer (Memorial Day through Labor Day) Recreation Use Groups

- River boaters below Oroville Dam
- Reservoir boaters at Lake Oroville, Forebay, Afterbay, and Diversion Pool
- Campers at Lake Oroville boat-in and floating campsites
- Swimmers at Lake Oroville, Afterbay, and Feather River

Again, these groups were not mutually exclusive; for example, some visitors were likely to be both swimmers and picnickers, and many boaters were likely to be campers. Special efforts were planned to reach interpretive/educational visitors (i.e., visitors to the Lake Oroville Visitors Center) and hunters. Goals for the number of completed surveys to be obtained from key visitor groups such as reservoir boaters, and a range for the total number of completed surveys, were agreed upon by the Recreation and Socioeconomics Work Group (Table 4.2-1).

Table 4.2-1. Sample goals for Lake Oroville Area On-Site Recreation Survey.

Target Group	Range of # of Completes
Recreation visitors to the study area (all groups)	1,300 to 2,000
Reservoir boaters	200 to 300
River boaters	100 to 200
Anglers	200 to 300
Trail users	100 to 150

Source: DWR 2002.

4.2.2.1 On-Site Survey Sampling Schedule

The survey sampling schedule covered the 12-month period starting on Memorial Day weekend 2002 and ending after Memorial Day weekend 2003. Four-hour survey sampling periods, during which one or two data collection staff were assigned to a specified recreation site to survey visitors, were scheduled on a monthly basis using a stratified random sampling design. The schedule was stratified by day of week (weekend/holidays and weekdays) and by time of day (morning, mid-day, and late day). Survey periods were scheduled for 8 am to 12 pm (morning), 12 pm to 4 pm (mid-day), and 4 pm to 8 pm (late day). The schedule emphasized weekends over weekdays, with approximately 8 to 12 periods scheduled each weekend day and 3 to 5 scheduled most

weekdays. Additional surveying was scheduled for the Memorial Day, Independence Day, and Labor Day extended holiday weekends.

Table 4.2-2 summarizes the schedule of survey periods for the first full month of data collection, June 2002, and provides an indication of the distribution on sampling at different times of day and days of the week. A similar distribution was maintained throughout the peak season. The schedule during the off-peak had an approximately equal distribution between weekday and weekend survey periods.

Table 4.2-2. Survey sample periods scheduled for Lake Oroville Area On-Site Survey, June 2002.

Time of Day	Weekend		Weekdays		Total	
	#	%	#	%	#	%
8 am to 12 pm	26	31.3	16	25.8	42	29.0
12 pm to 4 pm	33	39.8	25	40.3	58	40.0
4 pm to 8 pm	24	28.9	21	33.9	45	31.0
Total	**83**	**57.2**	**62**	**42.8**	**145**	**100.0**

Source: EDAW 2004.

The individual recreation sites where visitor surveys were conducted are listed by resource area in Table 4.2-3. Sites were randomly selected for particular strata (e.g., weekend, 12 to 4 pm), but with controls placed on the selection to avoid over or under sampling particular sites and to ensure that sampling was well-distributed geographically and temporally. Day use areas directly associated with boat ramps (Spillway, Bidwell Canyon, and Lime Saddle Boat Ramps on Lake Oroville, and at the South Forebay and Monument Hill Boat Ramps at the Forebay and Afterbay) were scheduled in conjunction with the boat ramps rather than as separate sites. Two surveyors were often assigned to high use day use areas and boat ramps to increase the number of visitors that could be contacted. Surveying at car-top boat ramps, which can only be reached by boat, was assigned in conjunction with other on-water data collection duties for other relicensing recreation studies.

The day of week and time of day that survey periods were scheduled at individual sites were varied to maximize the opportunity for different visitors and different types of visitors to be contacted. Factors such as site closures or reduced usability of a facility due to low reservoir pool levels were taken into account. Certain times of day were emphasized at particular types of sites to maximize the opportunity for survey contacts. For example, campgrounds were visited primarily in the morning or late day when campers were most likely to be on-site. Survey periods at day use areas were primarily scheduled for mid and late day, since morning use was typically very light. Survey periods at boat ramps were scheduled for the morning when anglers who had gotten on the reservoir early and pleasure boaters ending multiple day visits would be exiting. Periods scheduled during the late day provided the best opportunity to survey day use boaters ending their day on the water.

The schedule was reduced somewhat during July and August 2002, to about 100 survey periods per month, as Lake Oroville reached low pool levels and several boat ramps and other facilities became unusable. During September and October 2002, special emphasis was placed on contacting Feather River anglers during the salmon and steelhead seasons. With very low water levels in Lake Oroville and low use at most recreation sites, general surveying was minimized during the late fall and winter of 2002-03. Much of the surveying effort during that period was shifted to a survey of hunters using the OWA and Afterbay resource areas. As weather conditions improved and the pool level in Lake Oroville rose during the spring of 2003, surveying efforts at a broader range of sites were resumed.

Table 4.2-3. Lake Oroville area recreation survey sites.

Resource Area	Recreation Sites Where On-Site Surveys Were Conducted
Lake Oroville	• Bidwell Canyon Boat Ramp • Bidwell Canyon Campground • Bidwell Canyon Day Use Area • Bloomer Boat-In Camp • Craig Saddle Boat-In Camp • Dark Canyon Car Top Boat Ramp • Enterprise Boat Ramp • Foreman Creek Boat-In Camp • Foreman Creek Car Top Boat Ramp • Goat Ranch Boat-In Camp • Kelly Ridge Visitor Center and Day Use Area • Lime Saddle Boat Ramp • Lime Saddle Campground • Lime Saddle Day Use Area • Loafer Creek Boat Ramp • Loafer Creek Campground and Group Camp • Loafer Creek Day Use Area • Loafer Creek Equestrian Camp • Nelson Bar Car Top Boat Ramp • Oroville Dam Overlook / Day Use Area • Saddle Dam Trail Access • Spillway Day Use Area • Spillway Boat Ramp • Stringtown Car Top Boat Ramp • Vinton Gulch Car Top Boat Ramp
Diversion Pool	• Diversion Pool Day Use Area • Lakeland Boulevard Trail Access • Powerhouse Road Trail Access • Oroville Dam Blvd. Trail Access to Dan Beebe Trail
Low-Flow Channel	• Feather River Fish Hatchery • Riverbend Park and Feather River Fish Ponds
Thermalito Forebay	• North Forebay Day Use Area and Aquatic Center • South Forebay Boat Ramp and Day Use Area

Table 4.2-3. Lake Oroville area recreation survey sites.

Resource Area	Recreation Sites Where On-Site Surveys Were Conducted
Thermalito Afterbay	• East Hamilton Road Trail Access • Larkin Road Car Top Boat Ramp • Model Airplane Facility • Monument Hill Boat Ramp and Day Use Area • Wilbur Road Boat Ramp
OWA, Clay Pit area	• Afterbay Outlet • Clay Pit Shooting Range • Clay Pit State Vehicular Recreation Area • OWA East Levee Road (east bank of Feather River) • OWA West Levee Road (west bank of Feather River) • OWA Headquarters entrance

Source: EDAW 2004.

4.2.2.2 On-Site Survey Protocol

The wide range in types of recreation sites as well as differences in individual site layout and use required a consistent yet flexible On-Site Survey protocol. Initially, visitors were asked to participate in the survey effort by filling out a survey booklet on-site. Surveyors were trained on proper etiquette for approaching visitors and soliciting their survey participation. A brief introduction to the survey was used to explain the purpose of the survey and encourage participation. The rate of refusal was generally in the range of only 10-15 percent. Visitors were given DWR promotional floating key chains, lanyards, and maps as an outreach effort and an incentive to participate.

To participate in the study, visitors must have been recreating at the site where they were contacted for at least 30 minutes. (An exception was made to this protocol at sites where sightseers might not typically spend 30 minutes at the site.) At sites such as boat ramps and trailheads, visitors were generally contacted as they were concluding their visit and preparing to leave the study area. Visitors at campgrounds and day use sites were typically contacted as they used the sites. When use levels were low or moderate, an attempt was made to survey every group on-site or exiting. When use levels were too high to survey every group, the surveyors attempted to contact every second or third group.

The survey booklet typically required 10-15 minutes for completion, depending on whether the respondent completed any or all of the boating, fishing, and trail use sections. The surveyors stayed close by to give any assistance that might be needed in completing the survey, or answered visitors' questions when they returned to retrieve the survey booklet after a few minutes.

Respondents were asked to provide their name and address at the end of the survey booklet so that they could be mailed the follow-up survey which focused on their spending during their trip. Those who agreed to provide their name and address were

given a sheet explaining the purpose of the Mailback Survey and asked them to keep in mind their trip expenditures and the communities in which they occurred. A map depicted the Butte County communities specified in the Mailback Survey.

4.2.2.3 Windshield Survey Distribution

Because it was difficult to directly contact a sufficient number of visitors at some sites where use was widely dispersed or where the users were not present on-site (such as trailheads), a version of the On-Site Survey booklet to be placed on visitors' windshields was prepared. These survey booklets were accompanied by a cover letter, a postage-paid and addressed envelope to return the survey, and the map/Mailback Survey instruction sheet.

Windshield surveys were left on unattended vehicles at recreation sites with low visitor use and where visitors were dispersed or not available to be contacted on-site, such as trailhead accesses, car-top boat ramps, and OWA sites where direct contact with visitors was difficult. Included with the survey packets were the study area map with instructions related to the follow-up mail survey (like that given to those contacted in person) and a stamped and addressed envelope for mailing. Windshield surveys were also offered to those who were asked to participate at an awkward time, such as boaters departing the reservoir at dusk and as a last attempt to convince reluctant respondents to participate in the study. This procedure was especially helpful with reservoir boaters, as they were often occupied with the tasks involved in removing their boats from the water and frequently requested the opportunity to participate at a later time.

4.2.2.4 Mailback Survey Protocol

The mailback surveys were mailed 7-10 days after the original On-Site Survey contacts. Butte County residents and non-residents were sent slightly different Mailback Surveys to better estimate economic impacts to the study area. Postcards were sent to all mail survey recipients approximately 10 days after the initial mailing, regardless of whether or not they had returned their survey. The postcard asked non-respondents to complete and return their surveys as soon as possible, and thanked those individuals who had already completed and returned their surveys. Another postcard was sent to individuals who returned the Mailback Surveys but did not answer the question about their party size (party size information was essential to accurately estimate per capita spending for the economic impacts study). Finally, a second Mailback Survey with a cover letter encouraging participation was sent to all non-respondents approximately three weeks to a month after the initial survey mailing.

4.2.3 Survey Samples Obtained

On-Site Surveys were completed by a total of 2,583 people within the six resource areas that comprise the study area (Table 4.2-4). This number exceeded the goal stated in the Study Plan of 1,300 to 2,000 completed surveys to maximize the chance to obtain an adequate number of Mailback Survey responses, assuming a 40-50 percent response rate. The number of surveys obtained at specific recreation sites within each resource area is presented in Appendix B.

Table 4.2-4. On-Site and Mailback Survey samples obtained, by resource area.

Resource Area	On-Site Survey		Mailback Survey		
	Sample Size	Percent of Total	Sample Size	Percent of Total	Participation Rate (%)
Lake Oroville	1,396	54.0	632	59.0	45.3
Diversion Pool	62	2.4	32	3.0	51.6
Low-Flow Channel [1]	169	6.5	58	5.4	34.3
Thermalito Forebay	311	12.0	99	9.2	31.8
Thermalito Afterbay [2]	295	11.4	120	11.2	40.6
OWA [3]	350	13.6	130	12.1	37.1
Total	**2,583**	**100.0**	**1,071**	**100.0**	**41.5[4]**

1. Includes only sites upstream of SR 162; other Low Flow Channel sites are included within the OWA resource area.
2. Includes Clay Pit State Vehicular Recreation Area (SVRA) (On-Site Survey sample = 12), which was placed with the Afterbay resource area sample for purposes of analysis due to the shared emphasis on motorized recreation.
3. Includes the Clay Pit shooting range (On-Site Survey sample = 20), which is adjacent to OWA and also managed by DFG.
4. Participation rate includes those who did not provide a name or address on the On-Site Survey and thus did not receive a Mailback Survey. The actual return rate, based only on those who were sent a Mailback Survey, was about 45 percent. Similar adjustments apply to each resource area.
Source: EDAW 2004.

In total, 1,071 usable Mailback Surveys were completed, a participation rate of about 41 percent. One-hundred ninety three (7.5 percent) of the On-Site Survey respondents did not provide a mailing address; the response rate among those who were sent a mailback survey was 44.9 percent.

The number of On-Site Surveys obtained from three priority activity groups—reservoir boaters, anglers, and trail users—also exceeded the goals of 150 to 300 completed surveys, based on the number of respondents who completed the boating, angling, and trail use sections of the survey (1,361, 1,068, and 991 respondents, respectively). The Study Plan survey sampling goals were based on an assumption that only on-site surveying would be used. Because the actual sampling methodology used relied in part on the follow-up Mailback Survey, with an expected response rate of 35-50 percent, the on-site sample was intentionally increased.

The goal of surveying 100 to 200 river boaters is less easy to gage but was probably not met due to the nature of river boating in the study area, and due to the fact that river boaters are a relatively small user group. A total of 125 of the visitors who were surveyed in the Low Flow Channel and OWA resource areas (where the Feather River can be accessed) indicated they boated during their visit and completed the boating section of the survey. However, most of these 125 visitors were most likely reservoir rather than river boaters, who boated on Lake Oroville, the Forebay, or Afterbay during their visit. Also, only about 35 of the Low Flow Channel and OWA visitors indicated that their primary activity was boat fishing, motor boating, or non-motorized boating. The opportunity to survey river boaters was limited by the low number of boaters on the Feather River below the Diversion Pool (few were observed during most of the study period). Furthermore, most river boaters appeared to launch onto the river from a private campground ramp located on the Low Flow Channel but outside the study area, or from downstream of the study area, and so were not available to be surveyed on-site (through in-person or windshield surveys). Special efforts were made to contact river boaters as part of Study R-16 – *Whitewater and River Boating*, the results of which are discussed in that study report. Thus, data needs specific to those users was adequately supplemented in that particular study.

The temporal distribution of the On-Site Survey samples obtained, as shown in Tables 4.2-5 and 4.2-6, is heavily weighted toward the summer peak season, when use is greatest at most recreation sites (the Mailback Survey sample distribution is similar). The non-peak season sample was further reduced by a need to rely more heavily on windshield surveys as overall recreation activity diminished and became more dispersed. Only about 20 percent or less of the windshield surveys distributed were returned. The windshield surveys became more difficult to use during the rainy periods of the non-peak season, but were placed in protective plastic sleeves in some instances.

Table 4.2-5. On-Site Survey samples obtained by season.

Season	Survey Sample
2002 Peak Season (May 25 – September 15, 2002)	2,051
2002-03 Non-Peak Season (September 16, 2002 – May 14, 2003)	446
2003 Peak Season (May 15 - May 26, 2003)	86
Total	**2,583**

Source: EDAW 2004.

Table 4.2-6. On-Site Survey samples obtained by month.

Survey Month	Survey Sample
2002	
May	178
June	681
July	473
August	400
September	532
October	29
November	29
December	13
2003	
January	11
February	2
March	20
April	80
May	134
Total	**2,583**

Source: EDAW 2004.

4.3 HUNTER SURVEY

Because the Recreation and Socioeconomics Work Group recognized the existence of issues unique to hunting, a survey specific to hunters was developed. This survey assessed hunters' use patterns, attitudes and perceptions specific to the hunting experience, species hunted, and hunting locations. Although certain types of hunting are allowed in limited portions of the Lake Oroville State Recreation Area (LOSRA) on lands adjacent to Lake Oroville, the majority of hunting within the study area occurs at the OWA and at the Thermalito Afterbay, managed as a subunit of the OWA.

4.3.1 Hunter Survey Design

Similar to the On-Site Survey, the Hunter Survey was designed as a booklet to be self-administered. The booklet contained 25 questions on seven pages (considerably shorter than the On-Site Survey). The booklet was divided into three parts. Part 1 asked for a general description of the visit and past use of the area, with questions similar to those used in the On-Site Survey. Part 2 requested information about what portions of the study area the respondents used, what species they hunted for and number taken during the current trip, as well as perceptions of the area hunted and their hunting experience. Part 3 requested the same demographic information as the On-Site Survey. The survey concluded with a request for a name and mailing address to which a follow-up mail survey could be sent. The mail surveys (Butte County resident and non-resident versions) were for the most part identical in content to the Mailback Survey used for the general Recreation Visitor Survey, as described above. Some

perception and facility evaluation items deemed to be irrelevant to hunting were deleted. The on-site and mail Hunter Survey booklets are included in Appendix C.

4.3.2 Hunter Survey Sampling Schedule and Protocol

The Hunter Survey sampling schedule covered the period from mid-October 2002 through January 2003. All surveying occurred on weekends. The schedule included the opening days of the seasons for quail, duck, geese, dove, and pheasant. A surveyor was also present to contact hunters at a special youth pheasant hunt. Surveyors returned to the field during two weekends in early April 2003 to contact participants in the OWA spring turkey hunt (a total of 35 permits for the hunt were distributed by lottery). The sampling goal for the Hunter Survey was 100 respondents.

Hunters were contacted only within the OWA, including the Afterbay subunit. Hunters generally dispersed themselves through many parts of the OWA and parked at many undeveloped and roadside parking areas, as well as at certain trailheads. Because of this dispersed pattern of use, surveyors were assigned to traverse through different portions of the OWA rather than being assigned to survey at one particular site. Waterfowl hunters who used boats on the Afterbay were contacted at the three Afterbay boat ramps. Surveyors entered the area beginning in the early morning to note where hunters' vehicles were parked, then returned to those sites from mid to late morning to attempt to contact hunters as they concluded their hunt. Surveying generally concluded by about noon. Windshield versions of the survey were distributed when individual vehicles were encountered parked in dispersed areas or when surveyors felt they were not going to be able to return to an area where several vehicles were parked.

4.3.3 Hunter Survey Samples Obtained

In total, 98 hunters were surveyed in the OWA between October and January, and an additional 8 turkey hunters participated, for a total Hunter Survey sample of 106 respondents (Table 4.3-1). In total, 38 mailback surveys were returned, for a response rate of about 36 percent.

Table 4.3-1. Hunter Survey samples obtained by month.

Survey Month	On-Site	Mailback
October 2002	29	9
November 2002	44	19
December 2002	18	7
January 2003	7	3
April 2003 (spring turkey hunt)	8	0
Total	**106**	**38**

Source: EDAW 2004.

4.4 SIMILAR SITE SURVEY

Three reservoirs were selected as "similar sites" through consultation with the Recreation and Socioeconomics Work Group: Lake Berryessa, Black Butte Lake, and Shasta Lake. Each of these is a large, federally-managed reservoir that offers similar water-based recreation opportunities to Lake Oroville and the other study area reservoirs. Lake Berryessa, a 2-hour drive southeast of Lake Oroville, has 21,000 surface acres at full pool and is operated by the Bureau of Reclamation. Black Butte Lake, a 1-hour drive west of Lake Oroville, has 4,460 acres at full pool and is operated by the USACE. Shasta Lake, a 2.5-hour drive north of Lake Oroville, has 29,500 surface acres at full pool with recreation facilities operated by the U.S. Forest Service.

The primary purpose of the Similar Site Survey was to determine how visitors to other reservoirs in the Northern California region perceived conditions and rated their experiences at those sites, which would provide some means to compare similar information provided by Lake Oroville area visitors and add a regional context to those results. An additional purpose was to contact potential visitors to the Lake Oroville area to learn their perceptions of the area, if they had visited the area, and to learn what might motivate a first visit, if they had never been to the area. This survey also helped provide information on barriers to visitation information for Study R-14 – *Assessment of Regional Recreation and Barriers to Recreation*.

4.4.1 Survey Design

The Similar Site Survey borrowed from the On-Site and Mailback Survey instruments used in surveying visitors in the study area. Questions from both of these sources were combined into a single on-site survey booklet, eliminating the need for a follow-up mail survey.

Survey questions taken from the On-Site Survey covered general visitor characteristics and past use of the reservoir, reasons for visiting the site, recreation activity participation, perceptions of scenic value, and level of satisfaction with the trip. Similar to the Lake Oroville On-Site Survey, one section of the Similar Site Survey was focused specifically on boating, with questions about on-water crowding, encounters with and observations on unsafe boating behavior, type of watercraft used, waits at boat ramps, and satisfaction with boating. Survey questions taken from the Mailback Survey booklet included the series of questions asking visitors to indicate the degree to which various issues or conditions were a problem during their visit, and the series of questions asking visitors to evaluate whether the numbers of various types of facilities and services were adequate. The booklet concluded with the same suite of demographic questions used in the On-Site Survey. The duplication of these questions used in the study area allowed for direct comparison of responses between the similar sites and the Lake Oroville area.

One section of the Similar Site Survey contained questions unique to that survey that were intended to gage the perceptions of the similar site visitors regarding the Lake Oroville area, and interest in special events or facility enhancements that might motivate people to make a first visit to the area.
A copy of the Similar Site Survey is included in Appendix D.

4.4.2 Sampling Protocol and Samples Obtained

The sampling objective for each of the similar site reservoirs was to obtain 100 completed surveys. Sampling occurred at each site on at least two weekend days in July and August 2002. A sampling schedule was devised for each site that assigned surveyors to a range of boat ramp, campground, and day use sites around the similar site reservoirs. Permission to conduct the surveys was obtained in advance from the managing agency of each reservoir.

As shown in Table 4.4-1, sampling objectives were met at Lake Berryessa and Shasta Lake. At Black Butte Lake, 77 completed surveys were obtained after an additional day of weekend sampling. Late summer use is typically low at that site.

Table 4.4-1. Similar Site Survey samples obtained, by site.

Survey Site	Survey Sample
Shasta Lake	104
Lake Berryessa	112
Black Butte Lake	77
Total	**293**

Source: EDAW 2004.

4.5 HOUSEHOLD SURVEY

The purpose of the Household Survey was to estimate latent, or unmet, demand among regional residents for special events and recreation facilities in the Lake Oroville area, as well as to assess factors keeping residents from visiting the area for the first time or more often. The Lake Oroville area was defined for survey respondents as including the Oroville Reservoir, Thermalito Forebay, Thermalito Afterbay, Feather River below Oroville Dam, Oroville Wildlife Area (OWA), and Clay Pit SVRA. Because the intent was to contact people who live in communities some distance from the study area, and people who do not visit the area, a phone survey was used.

4.5.1 Survey Design

The Household Survey contained a total of 21 questions, not including the three screening questions. However, nine questions were asked only of respondents who

had visited the Lake Oroville area, and six questions were asked only of respondents who had never visited the Lake Oroville area.

Some of the major topics in the Household Survey included: other water-oriented recreation sites visited in Northern California, previous trip satisfaction and reasons for dissatisfaction (among past visitors to the Lake Oroville area), reasons for not visiting (among those who has never visited), and types of special events and facilities that would motivate visits to the study area. The survey concluded with a few questions on spending on recreation equipment and participation in recreation activities, and socio-demographic characteristics. A copy of the Household Survey is included in Appendix E.

4.5.2 Sampling Protocol and Sample Obtained

The overall goal of the household sampling efforts was to obtain 400 completed surveys from residents within Northern California and Northern Nevada, with a more specific sampling objective of obtaining 100 completed surveys in each of four strata representative of major visitor origins (market areas) for the Lake Oroville area. Those four strata were Butte County (the county in which the study area is located), along with the San Francisco Bay area (Alameda, Marin and San Francisco Counties), the Sacramento area and surrounding communities, and Washoe County, Nevada (the City of Reno and surrounding communities). Each of these market areas represents important sources of existing, or potential, visitors to the Lake Oroville area.

Sampling via telephone interviews occurred during the last week in June and first week of July 2002 between the hours of noon and 9:00 p.m. Random-digit dialing was used to identify and contact households within the four strata. Once contact had been initiated, the respondent was asked if she or he was willing to participate in a recreation study about rivers and lakes in Northern California. Respondents had to be at least 18 years old, have lived in Northern California or Nevada for at least six months, and have participated in outdoor recreation activities at rivers or lakes in Northern California at least three days during the last year. If the respondent met these criteria and agreed to participate, the telephone interview commenced. The overall sampling goal and the sampling objective for each stratum were met, with 100 surveys completed for each stratum (Table 4.5-1).

Table 4.5-1. Household Survey samples obtained, by stratum.

Survey Site	Survey Sample
Butte County	100
Reno, Nevada area	100
San Francisco area	100
Sacramento area	100
Total	**400**

Source: EDAW 2004.

4.6 OTHER SURVEYS

Two other limited scope, special purpose surveys, the Lower Reach Survey and the Supplemental Survey were conducted in addition to those analyzed for this report. Results from these two surveys are presented in R-16 – *Whitewater and River Boating* (Lower Reach Survey) and R-3 – *Assessment of the Relationship of Project Operations and Recreation* (Supplemental Survey). A survey of local private business owners/operators was conducted for Study R-18 – *Recreation Activity, Spending, and Associated Economic Impacts*, and the results are reported in that study report.

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5.0 STUDY RESULTS

This section presents results from the recreation surveys administered at the Project site, at similar recreation sites, by mailback survey, and by phone interview. Section 5.1 discusses the results of the On-Site Survey and part of the Mailback Survey. Section 5.2 discusses the results of the Hunter Survey, and Section 5.3 discusses the results of the Similar Site Survey. Section 5.4 discusses results of the Household Survey, administered by phone.

5.1 ON-SITE AND MAILBACK SURVEY RESULTS

As described in the Methodology section, recreation surveys administered at various locations within six general survey sites (resource areas) were followed by Mailback Surveys sent to respondent addresses provided in the On-Site Survey. Respondent responses to questions in both sets of surveys are presented here in the following sub-sections: Description of Current Visit, Perceptions and Preferences, Overnight Visitation, Description of Past Use, Regional Recreation, Fishing, Trails, Boating, Respondent Demographics, and Additional Comments.

Only responses to questions in Section D of the Mailback Survey are included in this discussion. Results from Sections A, B, and C focused on visitors' expenditures and related transportation, accommodations, and equipment information and are fully discussed in Study R-18 – *Recreation Spending and Economic Impacts*.

Most survey results are presented based on a geographic division of respondents. Responses given by visitors contacted at recreation sites within the following six resource areas that comprise the study area are presented side-by-side: Lake Oroville, Diversion Pool, Thermalito Forebay, Thermalito Afterbay, Low Flow Channel (LFC) of the Feather River, and OWA. This basis for analysis of the survey data recognizes the substantial differences in the recreation setting, facilities, opportunities, and management that exist across the resource areas. For the purposes of this analysis, the LFC includes only the portion of the river north of SR 162 (i.e., north of the OWA), although the LFC continues for several more miles downstream (within the OWA).

Select survey results are presented using additional categorizations that may serve to further reveal differences of interest in use patterns, perceptions, or opinions among recreation visitors. Additional categorization of responses include by season (peak season vs. non-peak season), by county of residence (Butte and adjacent counties vs. other counties), and by primary activity (boating, fishing, trail use, other day use, and camping activities). Respondent demographics are located in Appendix F.

The categorization of responses by county of residence is intended as a proxy for "local" vs. "non-local" or "tourist" groups, a comparison of particular relevance to discussions regarding marketing, demand, and potential economic impacts associated with

recreation in the study area. Butte and adjacent counties represent the "local" group well in that 88 percent of Butte County visitors surveyed were day users as were 67 to 100 percent of visitors from five of the six adjacent counties. Only 58 percent of Tehama County respondents were day users; however, the total sample from Tehama County was just 12 respondents and cannot be assumed to be representative.

The number of survey responses received from respondents (the sample size) in the various respondents groups varies by question. Rather than provide the number of responses for each group for each question, which would clutter the tables, Table 5.1-1 lists the total sample size for each relevant group. The number of responses to individual questions by specific respondent groups may be lower. Questions and respondent groups with very low numbers of responses are noted in the table footnotes.

Table 5.1-1. Survey sample sizes for specific respondent groups used for comparative analysis.

Survey Respondent Grouping Variables and Groups	On-Site Survey		Mailback Survey	
	Sample size (n)	Percent of sample	Sample size (n)	Percent of sample
Total Sample	2,583	100%	1,071	100%
Season when Surveyed				
Peak Season (May 15 to Sept. 15)	2,137	83%	891	83%
Non-peak Season (Sept. 16 to May 14)	446	17%	180	17%
County of Residence				
Butte and adjacent counties	1,575	61%	612	57%
Other California counties/out of state	911	35%	395	37%
Unknown[1]	97	4%	64	6%
Primary Activity during Visit				
Boating activities	713	28%	336	31%
Fishing activities	648	25%	253	24%
Trail activities	194	8%	102	10%
Other day-use activities[2]	557	22%	180	17%
Camping activities	125	5%	49	5%
Other[3]	128	5%	46	4%
Unknown (no primary activity listed)	218	8%	105	10%

1. No primary residence zip code provided by respondent.
2. Eleven non-boating, fishing, or trail use activities are included in this group; however, over 88 percent of the 557 On-Site Survey respondents indicated that their primary activity was swimming, relaxing, picnicking, or sightseeing.
3. This group includes a wide range of activities listed on the survey including several available only outside the study area (movies, shopping, golf), several available within the study area (hunting, ORHV use), and several listed by respondents as "other activities" on the survey (e.g., Frisbee golf, target shooting, casino gambling, model aircraft flying, walking on Oroville Dam).
Source: EDAW 2004.

5.1.1 Description of Current Visit

Respondents described their current visit to the Lake Oroville area through responses to on-site questions regarding arrival and departure times and dates, areas they planned

to visit, group size, reasons for visiting the Lake Oroville area, activities in which they participated, and primary activity during their visit.

5.1.1.1 Length of Visit

The majority of respondents from most of the resource areas were only visiting the study area for one day (Table 5.1-2). This was especially true for the LFC, Forebay, and Afterbay, where 80 to 90 percent of respondents were one-day visitors (no camping facilities exist in those areas). About 62-63 percent of respondents at the Diversion Pool and OWA were one-day visitors. The Lake Oroville resource area is the exception, with slightly less than half of respondents indicating they were visiting for only one day. Visits of two to three days (most often weekend visits) were the second most common length of visit at all areas. Visits longer than three days were relatively few in the study area with the exception of at Lake Oroville, where the 20 percent of visits in the four to seven day range were due to the predominance of camping facilities at that area. Few respondents stayed longer than seven days at any of the areas.

Table 5.1-2. Length of respondents' visit to the Lake Oroville area (days).

	Resource Area					
Length of Visit	**Lake Oroville (%)**	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
1 day visit	47.9	**61.8**	**79.6**	**87.6**	**90.0**	**62.9**
>1 day visit	**52.1**	38.2	20.4	12.4	10.0	37.1
2-3 days	26.4	34.5	10.2	6.2	5.2	23.4
4-7 days	20.4	3.6	3.0	5.0	4.4	8.6
8-14 days	3.0	0.0	3.0	0.8	0.0	1.6
>14 days	2.3	0.0	4.1	0.4	0.4	3.1
	Mean (Median)	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**
Number of days	3.3 (2)	1.6 (1)	3.9 (1)	1.5 (1)	1/3 (1)	2.9 (1)

Note: The Lake Oroville, LFC, and OWA resource areas included some respondents who reported visits of 30 days or more (and as long as 4 months), which increased the means for length of visit; the median length of visit values are less affected by the extreme high values and so are more representative of the visitors surveyed. ***Bold*** *type indicates the most frequent response category for each area.*
Source: On-Site Survey.

One-day visits predominated in the study areas as a whole both during the peak season and non-peak season (Table 5.1-3). Multiple-day visits appear to have been more frequent during the peak season, which corresponds to the period when campground occupancy is greatest. Visits of four or more days, in particular, were much more common during the peak season.

One-day visits were dominant among visitors from Butte and the adjacent counties, with over 86 percent of those surveyed not staying in the area overnight (Table 5.1-3). In

contrast, only 25 percent of visitors from more distant counties (and out of state) were on one-day visits while 75 percent were staying in the area overnight.

Table 5.1-3. Comparison of length of visit by season of survey and residence of respondent.

	Survey Season		Visitor Residency	
Length of Visit	**Peak Season (%)**	**Non-peak Season (%)**	**Butte & Adj. Counties (%)**	**Other Counties (%)**
1 day	**60.3**	**69.0**	**86.5**	25.1
>1 day	39.7	31.0	13.5	**74.9**
2-3 days	20.1	23.3	8.0	39.1
4-7 days	16.0	4.5	3.9	29.0
8-14 days	2.3	1.1	0.8	4.2
>14 days	1.3	3.3	0.9	2.6
	Mean	**Mean**	**Mean**	**Mean**
Number of days	2.4	2.1	1.6	3.9

*Note: **Bold** type indicates the most frequent response category.*
Source: On-Site Survey.

Focusing now on the number of hours that one-day visitors spent visiting the Lake Oroville area, the data indicate that visits tend to be about a half day (5 hours) or less (Table 5.1-4). The exception was visits to OWA, which more often consumed most or all of a day, including about one-quarter that were more than eight hours long. Visits to the OWA and Lake Oroville included a small percentage longer than 10 hours and as long as 16 hours. The most common length of one-day visits was in the range of 2.5 to 5.0 hours in all resource areas. Shorter visits (less than 2 hours) were most common at the Diversion Pool and the LFC, while visits longer than five hours were relatively uncommon at those areas.

Table 5.1-4. Length of 1-day visits to the Lake Oroville area (hours).

	Resource Area					
Length of Visit	**Lake Oroville (%)**	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
0.5 – 2.0 hours	22.6	35.5	27.3	17.2	22.0	15.6
2.5 – 5.0 hours	**39.0**	**45.1**	**50.0**	**44.3**	**42.6**	**32.7**
5.5 – 8.0 hours	27.9	12.9	18.2	30.7	25.8	25.8
>8.0 hours	10.5	6.5	4.5	7.8	9.6	25.9
	Mean (Median)	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**
Number of hours	4.8 (5.0)	3.8 (3.5)	4.0 (3.0)	4.7 (4.8)	4.6 (4.0)	6.1(6.0)

*Note: The Lake Oroville, LFC, and OWA resource areas included some respondents who reported visits of 30 days or more (and as long as 4 months), which increased the value for mean length of visit; the median length of visit values are less affected by the extreme high values and so are more representative of the visitors surveyed. **Bold** type indicates the most frequent response category for each area.*
Source: On-Site Survey.

5.1.1.2 Areas Planned to Visit

On-Site Survey respondents were asked indicate what portions of the study area they planned to visit during their trip to the Lake Oroville area. The overall pattern of responses suggests that some respondents had difficulty differentiating some of the 12 Lake Oroville and downstream zones listed in the survey, although a map with the zones clearly marked was provided in the survey booklet. Nevertheless, the responses do indicate whether visitors visit multiple study area recreation sites and whether they include both Lake Oroville and downstream areas in their visits.

At Lake Oroville, respondents generally visited two or more areas of the reservoir, but most did not visit downstream portions of the study area (Table 5.1-5). The Main Basin zone was visited by the greatest majority of those surveyed, reflecting the concentration of recreation facilities in that area. (Some respondents appeared to consider most of the reservoir to be the Main Basin and did not consult the provided map, which would have increased the percentage for Main Basin.) About 30 to 40 percent of Lake Oroville visitors indicated they planned to visit other areas of the reservoir besides the Main Basin. These visits were made primarily by boat; Study R-7 contains more detailed and precise information about boating use of each reservoir zone.

Table 5.1-5. Areas respondents planned to visit during current trip.

	Resource Area					
Areas Planned to Visit	**Lake Oroville (%)**	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
Lake Oroville (any area)	100.0	45.2	41.4	28.0	28.1	19.4
Main Basin	**81.8**	**37.1**	27.8	15.1	**20.3**	11.1
Middle Fork	38.5	19.4	16.6	8.4	9.8	8.3
South Fork	42.7	9.7	17.2	10.0	12.2	7.4
Lower North Fork	29.3	12.9	13.6	10.9	11.5	8.3
Upper North Fork	30.0	11.3	15.4	10.3	11.9	8.3
West Branch	38.0	6.5	14.2	8.7	10.2	6.9
Downstream (any area)[1]	22.1	29.0	57.4	37.3	34.2	51.1
Diversion Pool	5.1	100.0	17.8	12.5	3.7	8.9
Feather River [2]	11.5	19.4	100.0	12.2	9.8	19.4
Thermalito Forebay	10.5	16.1	27.8	100.0	16.6	11.7
Thermalito Afterbay	11.3	16.1	26.0	**21.2**	100.0	**29.1**
OWA [3]	11.1	9.7	**41.4**	16.7	15.9	100.0
Clay Pit SVRA	3.8	4.8	12.4	3.9	7.8	10.6

1. The percentage for the Lake Oroville resource area respondents relates to whether the respondents planned to visit <u>any</u> downstream areas; the percentages for the other resources areas relate to whether the respondent planned to visit <u>any other</u> downstream areas, besides where they were surveyed.
2. The survey specified that Feather River included only section between Diversion Pool and SR 162, which corresponds to the Low Flow Channel resource area.
3. The survey specified that OWA included Feather River downstream of SR 162.
*Note: The **bolded** percentage for the Lake Oroville resource area is the top response; the bolded percentages for the other resource areas are the top response <u>other than</u> for the resource area where they were surveyed.*
Source: On-Site Survey.

Visitors to the downstream areas tended not to visit Lake Oroville. Visitors to the Forebay, Afterbay, and OWA in particular tended to visit only those areas or other downstream portions of the study area. Plans to visit Lake Oroville were more common among those surveyed at the Diversion Pool and LFC. Trails link the Diversion Pool to Lake Oroville immediately upstream. The LFC is also relatively close to Lake Oroville, and the Lake Oroville Visitors Center and dam are popular sites on the itinerary of visitors contacted at sites like the Feather River Fish Hatchery on the LFC.

A majority of visitors at the LFC and OWA indicated they were planning to visit other downstream areas. Visitors to the LFC mentioned the OWA in particular, which offers similar angling opportunities to the LFC. Slightly less than 30 percent of OWA visitors indicated that they also planned to visit the adjacent Afterbay. Most visitors surveyed at the Diversion Pool, Forebay, and Afterbay were not planning to visit other downstream areas; just 29 to 38 percent indicated they plan to visit any of the six downstream areas.

5.1.1.3 Group Size and Composition

Visitors were asked to list the number of adults and children, if any, in their group. Those responses were summed to derive total group sizes. Several groups of more than 30 people and a few very large groups (as many as 150 or 200 people) were listed in some resource areas, indicating that respondents included others they did not necessarily travel to the area within their groups. Some of these groups were part of organized events like church group outings. Due to these large groups, the median group sizes are more representative of the visitors' groups than the mean group sizes.

The most common group size at all resource areas was groups of two to five people (Table 5.1-6). These groups comprised the majority at all areas except at the Forebay, where larger groups were more common. Median group sizes were three or four people at Lake Oroville, the LFC, and the Afterbay. The larger groups at the Forebay resulted in a median group size of seven. Groups at the Forebay also were most likely to include children (78 percent) and included the largest number of children, with about 38 percent of groups having five or more children (the mean was 7 and the median was 3 children). In comparison, about 54 percent of Lake Oroville groups included children, with about 88 percent of groups with fewer and 12 percent with more than five children.

Individual visitors were most common at the OWA and Diversion Pool. Those two resource areas also had the smallest median group sizes, with two people, and only 23 percent of the groups in each area included any children.

5.1.1.4 Reasons for Visiting the Lake Oroville Area

Recognizing that visitors have many lakes, reservoirs, rivers, and other recreation settings to choose from in Northern California that offer similar recreation opportunities

to the Oroville study area, respondents were asked to briefly describe why they chose to visit the Lake Oroville on their current trip.

Table 5.1-6. Visitors' group size and group composition (adults/children).

	Resource Area					
Group Size	**Lake Oroville (%)**	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
1 person	8.2	16.4	14.8	4.3	8.3	22.5
2 – 5 people	**56.3**	**70.4**	**64.2**	**38.0**	**55.1**	**66.0**
6 – 10 people	22.3	8.1	17.4	25.6	21.7	7.7
11 – 20 people	10.1	1.6	2.4	20.0	11.7	2.6
20+ people	3.1	3.2	1.2	12.1	3.0	1.2
Group Composition	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**
No. of adults	4.1 (3)	7.3 (2)	2.6 (2)	6.5 (3)	3.8 (2)	4.2 (2)
No. of children	1.9 (1)	1.1 (0)	1.7(0)	5.1(3)	2.4 (1)	0.6 (0)
Total group size	6.0 (4)	8.4 (2)	4.4 (3)	11.7(7)	6.2 (4)	4.8 (2)

Note: Each resource area included some very large groups (30 or more people), which increased the mean group size values; the median group size and associated adults/children medians are not as affected by extreme values and so are more representative of the groups surveyed. ***Bold*** *type indicates the most frequent response category for each area.*
Source: On-Site Survey.

Generally, the most common reason respondents at each resource area chose to visit the Lake Oroville area was because of its proximity to where they live, reflecting the importance of convenience and visitors' desire to minimize travel time (Table 5.1-7). From 35 to 56 percent of respondents in each resource area mentioned reasons that fit that category. At the OWA, however, almost 73 percent of respondents chose to visit because of the fishing opportunities, with proximity a distant second.

At Lake Oroville, other common reasons for visiting, in addition to proximity, included good resource conditions such as scenery and high water quality, good facilities, and good fishing opportunities. These top five categories of reasons comprised most of the responses given, although many other reasons were listed.

The reasons provided were generally similar for the three downstream reservoirs (the Diversion Pool, Forebay, and Afterbay). However, at the Diversion Pool equestrian trail riding opportunities and a special equestrian trail ride event based near the Diversion Pool were of special importance. Swimming opportunities were among the top three reasons mentioned by Forebay visitors (primarily due to the popular swim beach at the North Forebay DUA), and good social conditions (primarily lack of crowds) were among the top five reasons at both the Forebay and Afterbay.

For visitors to the LFC, fishing opportunities and activities such as walking and picnicking were popular reasons for visiting the Lake Oroville area, in addition to

proximity to their homes, while natural resource conditions and facilities received little mention.

Table 5.1-7. Visitors' reasons for visiting the Lake Oroville area, by resource area.

Reason Category	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Proximity to home	**43.3**	**41.7**	**35.3**	**46.5**	**56.0**	17.6
Good natural resource conditions (water quality, scenery, etc.)	16.5	18.3	6.5	13.3	13.8	5.8
Good facilities/ maintenance	11.1	20.0	2.9	14.7	9.3	1.0
Fishing opportunities	10.4	5.0	27.3	7.7	11.9	**72.8**
Familiar/favorite	9.0	6.7	7.9	7.7	7.1	5.1
Friends/family there	8.0	3.3	7.2	3.5	3.4	3.2
Boating opportunities	7.6	1.7	2.2	3.8	7.8	0.3
Good social conditions (not crowded, nice people, etc.)	7.6	10.0	7.2	13.3	13.1	5.8
New place to go or change of pace	6.9	3.3	4.3	4.2	3.0	0.6
Walking, hiking, picnicking, other land-based activities	5.4	8.3	15.8	9.1	5.6	9.6
Boat kept at marina	5.0	0.0	0.0	0.0	0.7	0.0
Special event	3.7	26.7	4.3	5.2	0.4	0.0
Horse riding	3.4	18.3	0.0	0.0	0.0	0.0
Swimming or other water-based activity	2.3	0.0	3.6	16.1	8.2	1.3
Low cost	2.1	1.7	0.0	3.8	8.6	2.9
Easy access	1.2	1.7	4.3	2.4	6.3	0.3
Off-road recreation	0.0	0.0	0.0	0.0	1.1	0.3
Other reasons	1.8	1.7	3.6	0.7	1.1	0.0

Note: Percentages represent the portion of respondents who mentioned a reason in the listed category, not a percentage of all responses (reasons) given; because respondents could list multiple reasons, and reasons within multiple categories, the percentages total more than 100 percent for each resource area. ***Bold*** *type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.1.5 Activities Participated in During Current Visit to Lake Oroville Area

Visitors were presented a list of 42 recreation activities in five categories (wildlife, urban, boating, active, and passive activities) and asked to indicate which of the activities they had or expected to participate during their trip to the Lake Oroville area. Respondents could specify other unlisted activities. Because the responses related to the trip rather

than only the survey site, unless respondents were only visiting the survey site, the activities participated in do not directly correlate with that site.

The results for some activities at some areas may be influenced by the survey schedule and the sample obtained. Estimates for participation in boat fishing at Lake Oroville, in particular, may have been lowered by the fact that the prime angling season on the reservoir is during the fall and winter, when less recreation activity occurs at most sites and when, consequently, less surveying was done (the major On-Site Survey effort was conducted during the peak season). Also, attempts to survey participants in fall bass tournaments were not successful. Hunting participation within the OWA may be higher than the percentage reported here, in that most hunters surveyed received the Hunter Survey rather than the general On-Site Survey, which was not intended to secure hunter input (see Section 5.2 for Hunter Survey results). Hunting does not ordinarily take place at the same locations as the majority of other recreational activities; therefore separate survey efforts were warranted.

The five most frequent responses from visitors surveyed at each resource area are indicated in bold type in Table 5.1-8. The “passive” activity of relaxing was the only activity to be among the five most popular activities across all resource areas. About one-quarter to one-half of respondents at each area indicated that relaxing was one of their activities. The activity was most prominent at Lake Oroville and the Forebay. Picnicking, another “passive” activity, was most popular at the Forebay, with just over half of respondents participating.

Swimming was among the five most popular activities for all resource areas, except the Diversion Pool. It was the most popular among visitors to the Forebay, site of the popular North Forebay DUA swim beach, where over 70 percent of respondents participated in swimming. It was also popular among visitors to the Afterbay and Lake Oroville, where 51 and 57 percent, respectively, of the survey respondents participated. The associated activity of sunbathing was also among the top five activities among visitors surveyed at Lake Oroville, the Forebay, and the Afterbay, with 33 to 42 percent participation. Two other associated activities, motor boating and water-skiing/wake boarding, were among the top five activities at Lake Oroville and the Afterbay. About one-third of respondents participated in water-skiing/wake boarding and 38-45 percent participated in motor boating at the two resource areas.

At the OWA, bank fishing was the most common activity by a wide margin among visitors surveyed, with nearly 80 percent participation. Bank fishing was also the most common activity among LFC visitors, with just over 40 percent participation. Trail activities in the “active” group, including hiking, horseback riding, and dog walking, were, along with relaxing and sightseeing, among the top five activities at the Diversion Pool. Nearly 60 percent of those surveyed were horseback riding while about one-fourth were hiking or dog walking.

Table 5.1-8. Activities participated in during visit to Lake Oroville area.

Activity / Activity Groups		Resource Area					
		Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Wildlife	Bank fishing	19.3	12.9	**41.4**	**27.3**	22.4	**78.9**
	Boat fishing	33.0	17.7	18.9	9.3	22.7	**20.9**
	Hunting	1.6	0	3.6	2.3	5.1	6.9
	Nature study	9.2	17.7	18.3	11.6	4.1	4.9
	Bird watching	11.0	16.1	21.9	19.0	7.8	11.1
Urban	Movie/theater	8.1	6.5	16.0	15.4	9.2	6.0
	Shopping	8.1	8.1	14.8	15.1	7.8	6.9
	Museums	3.0	4.8	4.1	6.1	2.7	1.4
	Amuse. park	1.2	1.6	4.7	2.9	3.7	1.7
	Dining out/bar	13.9	11.3	20.1	17.7	11.2	**17.4**
	Concert/festival	3.8	4.8	11.8	5.1	5.4	3.7
	Educ. events	2.1	1.6	7.1	3.5	1.0	1.4
Boating	Rafting	5.2	1.6	4.1	10.0	6.4	6.6
	Motor boating	**45.1**	11.3	16.6	11.6	**37.6**	10.0
	House boating	15.0	8.1	4.7	3.5	7.5	2.3
	PWC use	16.2	4.8	7.1	9.0	27.1	3.7
	Sailing	2.1	0	1.8	3.2	2.4	0.3
	Kayaking	2.9	8.1	3.0	5.8	1.7	1.1
	Canoeing	2.0	6.5	3.6	4.5	1.7	2.3
	Windsurfing	0.6	0.0	0	1.9	1.0	0.0
	Water-skiing	**34.0**	6.5	9.5	5.1	**33.6**	2.9
Active	Swimming	**57.0**	17.7	**30.8**	**70.7**	**50.8**	**23.7**
	Tennis	0.6	0.0	3.0	2.3	1.7	0.6
	Golf	3.2	1.6	10.1	2.9	3.1	2.6
	Hiking	18.6	**22.6**	**26.0**	19.6	7.8	10.6
	Backpacking	2.9	6.5	8.3	4.8	2.4	4.0
	ORV/ATV use	5.4	3.2	4.7	5.5	9.2	6.9
	Road Biking	7.7	11.3	14.2	6.8	3.4	4.9
	Mtn. Biking	5.9	14.5	11.8	7.1	3.1	4.0
	Horsebk. riding	6.0	**59.7**	4.1	4.5	4.1	2.9
	Tent camping	23.6	8.1	15.4	12.5	7.5	13.1
	Float camping	4.2	0.0	4.1	2.3	3.4	1.1
	Dog walking	14.2	**24.2**	17.8	11.9	8.5	4.9
	Gold panning	3.8	3.2	8.9	6.4	3.7	2.9
Passive	Sunbathing	**37.6**	12.9	16.6	**42.1**	**33.2**	13.7
	Sightseeing	25.6	**25.8**	**24.3**	22.8	15.3	12.6
	Photography	17.0	14.5	16.0	19.6	9.2	7.1
	Picnicking	26.4	12.9	20.7	**52.4**	31.5	13.1
	Paint/Drawing	2.5	3.2	3.6	5.1	2.0	1.4
	Relaxing	**46.6**	**33.9**	**32.0**	**52.1**	**38.0**	**25.1**
	RV Camping	12.1	6.5	6.5	4.8	2.4	7.4
	Rock Collecting	8.5	8.1	11.2	10.6	5.1	6.6

*Note: **Bold** type indicates the top five activities participated in for each resource area. Respondents could check more than one activity on the list.*
Source: On-Site Survey.

About one-fourth of LFC visitors were also hiking during their visit. Many visitors in both areas were surveyed at trailheads or at Riverbend Park, where a paved bike trail passes through.

5.1.1.6 Primary Activity During Visit to the Lake Oroville Area

In addition to indicating the activities in which they had participated (or in which they planned on participating), On-Site Survey respondents were asked to specify which activity they considered to be their primary activity during their visit to the Lake Oroville area. Table 5.1-9 lists the 12 activities that accounted for at least 5 percent of respondents' primary activities at any resource area. With the exception of the LFC, these activities account for 82 to 93 percent of the respondents' primary activities in each resource area. The results, as expected, reflect the popularity of certain activities as indicated in the preceding section. However, activities such as swimming had high levels of participation but were not often regarded by the respondents at most areas as a primary activity.

Table 5.1-9. Visitors' primary activity during their trip to the Lake Oroville area.

	Resource Area					
Activity	**Lake Oroville (%)**	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
Motor boating	**15.7**	--	4.3	2.1	**17.3**	0.6
Boat fishing	14.4	3.4	2.9	2.4	10.1	9.3
Water-ski/ Wake board	14.0	--	2.1	0.3	12.9	0.6
Swimming	7.8	1.7	4.3	**37.4**	12.2	3.5
Sightseeing/ Relaxing	7.8	1.7	8.6	11.9	3.6	3.2
House boating	6.2	--	--	0.3	0.7	0.3
Bank fishing	5.0	3.4	**29.3**	11.5	11.5	**70.0**
Horseback riding	4.3	**58.6**	1.4	--	--	0.6
PWC use	3.8	--	0.7	0.7	14.0	3.8
Hiking	1.8	5.2	7.1	1.0	0.4	--
Picnicking	1.2	0.0	1.4	14.0	2.2	0.6
Mountain biking	1.2	8.6	2.1	0.3	0.4	--

Note: Only activities that accounted for at least five percent of respondents at one geographical resource area are shown. ***Bold*** *type indicates the activity with the highest percentage for each area.*
Source: On-Site Survey.

At the Diversion Pool, LFC, Forebay, and especially the OWA, one activity accounted for a much larger portion of respondents' primary activities than any other. At the Diversion Pool, the dominant activity was horseback riding. At Thermalito Forebay, swimming was clearly the dominant activity, due to the previously mentioned swim beach. At both the LFC and OWA, bank fishing predominated, although to a much larger degree at the OWA where it comprised 70 percent of responses. At Lake Oroville and the Afterbay, several water-based activities accounted for similar percentages of respondents' primary activities. At both areas, the most frequent primary activity was

motor boating, accounting for 16-17 percent of respondents' primary activities. Boat fishing and water-skiing/wake boarding were somewhat less frequently mentioned at each area (10-14 percent) but comprised similar percentages of responses. PWC use, swimming, and bank fishing also each accounted for about 12-14 percent of responses at the Afterbay.

5.1.1.7 Overnight Visitation

This section presents results from questions asking respondents whether or not they stayed overnight in Butte County during their visit to the Lake Oroville area and, if they did stay overnight, what type of accommodation they used. Visitors to the Lake Oroville area can camp at several developed drive-in campgrounds at Lake Oroville as well as at boat-in and floating campsites. Undeveloped ("en-route") RV camping is available at the North Forebay BR/DUA and Spillway BR/DUA parking lots, and primitive camping is allowed at several sites within the OWA. One private campground is situated near the study area on the Feather River. Several types of commercial lodging are available within a short drive of the study area in the cities of Oroville and Paradise, as well as in Chico and other more distant communities in Butte County.

Overnight Stays in Butte County (excluding at own home)

About half of the Lake Oroville visitors surveyed were staying overnight in Butte County (Table 5.1-10). This is a similar percent who indicated their trip was more than one day in length. Surprisingly, nearly half of the Diversion Pool visitors surveyed were also staying overnight, although there are no camping facilities in the area. Several of the visitors surveyed at the Diversion Pool were participating in an equestrian trail ride event and stayed overnight at a staging area near the Diversion Pool. The percent staying overnight was over seven percent more than were on multiple day visits. It appears that some visitors were only recreating in the area for the day, but were on a multiple day trip and stayed overnight elsewhere in Butte County during the trip.

Table 5.1-10. Overnight stays in Butte County.

Staying overnight in Butte County?	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Yes	49.5	45.6	27.5	15.3	15.3	38.0
No	**50.5**	**54.4**	**72.5**	**84.7**	**84.7**	**62.0**

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

Visitors staying overnight in Butte County were fewer at the remaining four resource areas, with about 38 percent of OWA visitors staying overnight, about 28 percent of LFC visitors staying overnight, and about 15 percent of Forebay and Afterbay visitors staying overnight. Similar to the Diversion Pool, these percentages are several points higher

than the percent on multiple day trips. Once again, it appears that some respondents recorded as one-day visitors (they listed the same arrival and departure date on the survey) were staying overnight in the area, either as part of a multiple day trip to the Lake Oroville area or a trip that included other destinations.

Visitors' Overnight Accommodations

Of those staying overnight, the majority of respondents at Lake Oroville (62 percent), the Diversion Pool (62 percent), and the OWA (58 percent) were staying in a vehicle campground (Table 5.1-11). At the Diversion Pool and OWA, this referred to camping at undeveloped sites in tents, RVs, and horse trailers with sleeping quarters. Most of the remainder of Lake Oroville overnight visitors stayed on houseboats (15 percent) or with family or friends who live in the area Oroville (12 percent). Most others at the Diversion Pool also stayed with family or friends, while most others surveyed at the OWA stayed in a motel.

At the LFC and Forebay, vehicle camping was also the most common type of accommodation (33 percent and 44 percent, respectively), but did not comprise a majority. At both areas, the second most common type of accommodation was stays with family and friends. Nearly one quarter of the overnight visitors surveyed at the LFC were staying in a motel. At the Afterbay, about 50 percent of the overnight visitors stayed with family and friends, while about 19 percent stayed at a vehicle campground (primarily at the primitive OWA camp areas).

The overnight visitors at areas other than Lake Oroville who stayed on houseboats are assumed to have stayed on a boat moored on Lake Oroville, since houseboats are not found on the other study area reservoirs. Similarly, boat-in campgrounds and floating campsites are only available at Lake Oroville.

Table 5.1-11. Type of accommodations used by overnight visitors.

Type of Accommodation	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Vehicle campground	**61.8**	**61.5**	**33.3**	**44.2**	19.0	**57.7**
Boat-in campground	2.6	0.0	5.1	7.0	2.4	0.8
Floating campsite	2.2	0.0	5.1	4.7	0.0	0.0
Houseboat	15.3	7.7	0.0	4.7	9.5	0.8
Motel	2.8	0.0	23.1	4.7	7.1	26.0
Bed and breakfast	0.0	0.0	5.1	4.7	0.0	0.0
Other (family, friends)	12.4	26.9	28.2	23.3	**50.0**	10.6
No data	2.9	3.9	0.1	6.7	12.0	4.1

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

The relatively high number of visitors who said they were staying with family or friends suggests that the proximity of communities to the study area encourages visitors to make trips to the area during which they may visit with family and friends and make use of the recreation opportunities provided by the study area.

5.1.2 Frequency of Visits and Seasonal Pattern of Visitation

To get a better sense of visitors' pattern of use of the study area, the On-Site Survey asked them to describe their frequency of visits to the Lake Oroville area and the seasons during which they had visited in the past 12 months.

5.1.2.1 Frequency of Visits

At each resource area, at least 64 percent of respondents considered themselves to be regular visitors, which was defined as visiting 3 or more times per year (Table 5.1-12). The percentage of regular visitors was nearly 80 percent at the Afterbay. Most other visitors across all six resource areas were at least occasional visitors, defined as visiting 1-2 times per year. Lake Oroville and the Diversion Pool had the most first time visitors, with 14-15 percent. First time visitors comprised less than 10 percent of visitors to the other four resource areas.

Table 5.1-12. Visitors' frequency of visits to the Lake Oroville area.

	Resource Area					
Visitor Frequency	**Lake Oroville (%)**	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
Regular visitor[1]	**64.3**	**64.4**	**71.0**	**69.7**	**79.4**	**72.6**
Occasional visitor[2]	15.9	18.6	16.6	16.4	12.3	14.7
Infrequent visitor[3]	4.9	3.4	4.8	4.0	2.4	4.6
First time visitor	14.8	13.6	7.6	9.9	6.0	8.1

[1] Defined as visiting 3 or more times per year.
[2] Defined as visiting 1-2 times per year.
[3] Defined as visiting less than 1 time per year.
*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.2.2 Seasons of Visitation

Overall, data on seasonal visitation indicate that most of the study area receives steady use during at least part of several seasons. As expected, summer was the season during which the highest percentage of respondents had visited during the previous 12 months at all the resource areas (77 to 91 percent). An exception was the Diversion Pool, where 79 percent had visited during the fall as compared to 68 percent during the summer (Table 5.1-13).

Spring was the season during which the second highest number of respondents at each area tended to visit, with the exception of the OWA, where fall was the second most popular season. With the exception of the OWA, about half to two-thirds of visitors in each area visited during the spring. In addition to the Diversion Pool, a majority of LFC and OWA visitors had visited during the fall. The lowest percent of respondents in each of the resource areas visited during the winter, with less than 30 percent of visitors surveyed at Lake Oroville, the Forebay, the Afterbay, or the OWA visiting during the winter. Visitors to the LFC and Diversion Pool, both close to residential areas and principally visited by trail users, more often reported winter visits.

Table 5.1-13. Season(s) during which visitors had come to the Lake Oroville area during the previous 12 months.

Season	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Spring	54.6	67.7	58.0	54.0	50.5	38.9
Summer	**87.1**	67.7	**78.1**	**91.0**	**91.2**	**77.1**
Fall	43.1	**79.0**	54.4	39.2	40.7	54.6
Winter	29.6	45.2	39.6	26.4	26.1	26.0

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

Some differences emerge when seasons of visitation are compared among those surveyed during the primarily summer peak season and those surveyed during other times of year. As seen above, summer and spring are the most popular times to visit, but the non-peak season respondents had visited much more frequently in the fall and winter, and were somewhat less likely to have visited during the summer.

The pattern of seasonal visitation was similar between residents of Butte County and adjacent counties and those from more distant counties (and out of state), with summer being the most popular time to visit. The primary difference is that the visitor from outside the local region of Butte and adjacent counties were only slightly less likely to have visited during the summer, but 20-30 percent fewer had visited during the other seasons than those from the local region (Table 5.1-14).

Table 5.1-14. Comparison of season visitors had visited the Lake Oroville area during the previous 12 months, by season of survey and residence of respondent.

Season Visited Lake Oroville Area	Survey Season		Visitor Residency	
	Peak Season (%)	Non-peak Season (%)	Butte & Adj. Counties (%)	Other Counties (%)
Spring	50.4	62.3	64.9	32.1
Summer	**88.4**	**72.4**	**90.3**	**79.0**
Fall	40.5	69.5	53.6	33.9
Winter	26.5	42.8	38.5	14.6

*Note: **Bold** type indicates the most frequent response.*
Source: On-Site Survey.

5.1.3 Visitors' Perceptions and Preferences

Gaining information about visitors' recreation-related perceptions and preferences was a primary objective of the survey efforts. Questions asked of respondents during their visit pertained to their perceptions of crowding and the quality of scenery surrounding their particular survey site. The Mailback Survey asked visitors to describe any recreation activities or special events not offered in the Lake Oroville area that they would like to have available. Mailback Survey respondents also were presented with a series of scale-type questions in which they could express their preference for the types of recreation opportunities and associated settings in the Lake Oroville area. Finally, two tables allowed visitors to indicate, first, whether they found certain management, water condition, and user interaction issues to be a problem during their visit, and second, whether they found the number of several specific types of facilities and services to be sufficient in number or amount. This section also reports respondents' overall satisfaction with their recreation experience at the Lake Oroville area.

5.1.3.1 Perceived Crowding

On-Site Survey respondents were asked to rate the level of crowding at the location where they were interviewed using a 9-point scale, with 1 meaning "not at all crowded" and 9 meaning "extremely crowded." Thus, lower scores signify a more desirable condition than higher scores.

With the exception of the OWA, the overwhelming majority of respondents considered the site where they were interviewed to be "not at all crowded" to "slightly crowded" (the lower third of the scale) (Table 5.1-15). This was the perception of at least two-thirds and as many as 90 percent of the respondents of the five resource areas, with different responses evident at the OWA. About 20 percent of respondents in those resource areas (9 percent at the Diversion Pool) rated crowding in the middle third of the scale (4-6), the upper end of which corresponded with "moderately crowded." From 5 to 11

percent at four of the resource areas rated crowding at 7 or above; none did so at the Diversion Pool.

In contrast, visitors' perceptions of crowding at the OWA were considerably higher, with the most frequent rating a 6 or "moderately crowded." Only about 35 percent of visitors rated crowding between 1 and 3, while 36 percent rated crowding in the middle range of 4 to 6. Exactly 50 percent of respondents rated the area as being between "moderately crowded" and "extremely crowded," two to three times the percentage at most of the other areas. These responses relate both to the heavily used Afterbay outlet area, a well-known fishing site where many anglers congregate, and some riverbank and riffle areas where anglers may compete for space.

The mean crowding scores for each resource area confirm the response pattern, with average scores below 2 for the Diversion Pool, slightly below 3 for Lake Oroville and the LFC, slightly above 3 for the Forebay and Afterbay, and about 5 for the OWA.

Table 5.1-15. Visitors' perception of crowding at the recreation area where they were surveyed.

	Resource Area					
Crowding Rating	**Lake Oroville (%)**	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
1 – Not at all crowded	**44.5**	**75.9**	**53.0**	**40.3**	**38.0**	15.2
2	11.2	10.3	9.3	14.8	14.5	7.6
3 – Slightly crowded	15.2	5.2	13.9	11.4	14.9	12.2
4	4.8	5.2	3.3	6.4	3.6	6.4
5	5.9	1.7	5.3	6.0	6.2	8.5
6 – Moderately crowded	11.3	1.7	10.6	10.4	12.0	**21.0**
7	3.8	0	0.7	3.7	4.7	7.6
8	1.7	0	1.3	1.3	2.2	5.5
9 – Extremely crowded	1.6	0	2.6	5.7	4.0	15.9
Mean rating	2.8	1.5	2.6	3.1	3.2	5.0

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

A comparison of perceptions of crowding by season indicates that, while overall crowding scores were not high during the peak season (with nearly two-thirds of respondents rating crowding between 1 and 3), nearly 75 percent of respondents gave those ratings during the non-peak season (Table 5.1-16). Non-peak season mean crowding scores were about 0.7 points lower than during the peak season. This is the pattern that would be expected in that most recreation sites received their greatest levels of use during the peak season.

Comparison of crowding scores between those given by visitors who reside in the local region of Butte and surrounding counties and those who reside in other more distant counties indicates that the local visitors have a slightly lower overall perception of

crowding. However, the mean crowding scores given by those from more distant counties were only about 0.4 points higher, and over 60 percent of respondents in both groups rated crowding as relatively low, with scores between 1 and 3. Scores in the moderate and high ranges (4-6 and 7-9) were only a few percentage points higher from visitors from more distant counties. Much of the difference may be related to the relatively high number of visitors from outside the local region who visit the OWA, where the highest perceptions of crowding were found.

Table 5.1-16. Comparison of crowding perceptions by season of survey and residence of respondent.

	Survey Season		Visitor Residency	
Crowding Rating	Peak Season (%)	Non-peak Season (%)	Butte & Adj. Counties (%)	Other Counties (%)
1 – Not at all crowded	**39.3**	**46.7**	**42.9**	**36.5**
2	10.9	13.8	11.8	10.8
3 – Slightly crowded	14.0	13.8	13.7	14.7
4	5.0	5.0	4.9	5.0
5	6.2	6.2	5.0	8.1
6 – Moderately crowded	13.1	8.8	12.1	13.0
7	4.3	3.1	4.3	3.6
8	2.5	0.7	1.6	3.2
9 – Extremely crowded	4.8	1.9	3.8	5.2
Mean rating	3.3	2.6	3.0	3.4

*Note: **Bold** type indicates the most frequent response.*
Source: On-Site Survey.

5.1.3.2 Perceptions of Scenic Quality

On-Site Survey respondents were asked to rate the scenery at the location where they were interviewed on a 9-point scale. The scale used was similar in form to the crowding scale discussed above, with 1 labeled “extremely unappealing” and 9 labeled “extremely appealing.” In this case, however, higher scores signify a more desirable rather than a less desirable condition.

Generally, the most frequent response was a score of 6 or “appealing,” and all but the Afterbay and OWA had average scenery ratings higher than 6 (Table 5.1-17). The scores for the Diversion Pool were particularly high, with the most frequent response being the highest possible score of 9, or “extremely appealing,” and an average scenery rating of 7.5. From 77 to 92 percent of visitors at Lake Oroville, the Diversion Pool, LFC, and Forebay rated the scenery at 6 or higher.

Scenery ratings were slightly lower at the Afterbay and OWA, with a greater percentage of ratings of 5 in particular and mean scores slightly below 6. Very few respondents surveyed in any of the resource areas judged the quality of scenery to be a 3 (“unappealing”) or below.

Table 5.1-17. Visitors rating of scenery at recreation sites.

Scenery Rating	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
1 – Extr. unappealing	2.5	1.7	0.0	1.0	2.1	3.1
2	0.9	0.0	0.0	1.0	2.1	0.9
3 – Unappealing	3.2	1.7	0.0	3.7	7.4	6.5
4	4.3	0.0	3.9	4.4	8.1	5.2
5	12.2	5.1	13.7	12.9	23.3	22.5
6 – Appealing	**29.7**	18.6	**42.5**	**36.6**	**31.4**	**34.9**
7	19.0	18.6	14.4	15.6	9.5	10.2
8	9.7	13.6	7.8	8.8	2.8	4.6
9 – Extr. Appealing	18.4	**40.7**	17.6	15.9	13.1	13.0
Mean Rating	6.5	7.5	6.6	6.4	5.7	5.8

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.3.3 Visitors' Interest in Recreation Activities or Special Events Not Offered in the Lake Oroville Area

Mailback survey respondents were asked if there were any recreation activities or special events not offered in the Lake Oroville area that they would like to do (or be a spectator of). About 80 percent of respondents did not respond or checked the response stating “No, all the opportunities I wanted were offered,” while about 20 percent checked “yes” and wrote down one or more specific requests. However, about half of those were considered not valid because they mentioned activities already widely available in the Lake Oroville area or some type of addition or improvement to existing facilities unrelated to a new activity.

Table 5.1-18 lists the requested activities (or facilities to support new activities) and events requested, grouped into several broad categories, and the number and percent of visitors who mentioned each. Because the total number of valid responses was low, they are not further divided and presented by geographic area, as were the preceding survey responses. Requests in each category mentioned by only a single respondent are grouped as “other responses” (the full list of responses is provided in Appendix G). A few of the items listed may be available in the Lake Oroville area but not at the area where the visitor was surveyed (e.g., at Lake Oroville but not at the Forebay). These responses were considered valid because the survey data indicate that many visitors limit their visits to one area; these responses are understood to express a desire for new activities at the areas they prefer to use.

Requests for water-based activities and related facility additions were most common. Although 16 different requests were made in that category, only one request was mentioned by more than a few visitors: a beach or swim area on Lake Oroville (the existing swim beach at the Loafer Creek DUA was usable for just a few weeks at the

start and the end of the 12-month survey period). Several other water-based activities were mentioned by three to seven visitors, while the remaining 10 were mentioned by just one or two people.

Table 5.1-18. New activities and special events that visitors would like offered in the Lake Oroville area.

Activity / Event	No. of responses	Percent of respondents
Water-based activities (or support facilities/services)		
Beach area/swimming area (Lake Oroville)	26	14.3
Paddle boat/canoe/kayak rentals	7	3.8
Para-sailing	6	3.3
Buoys for skiing/ski slalom course	4	2.2
Water slide	3	1.6
Lake cruise/boat tours	3	1.6
Whitewater boating	2	1.1
Warm water swimming/pool	2	1.1
Other (8 activities/facilities, each mentioned once)	8	4.4
Camping/campground activities (or facilities)		
Shoreline/waterside camping (not boat-in)	5	2.7
Campfires (in campgrounds)	4	2.2
Other (3 activities/facilities, each mentioned once)	3	.6
Special events		
Athletic competition (triathlon, running, biking, etc.)	6	3.3
Water-ski competitions/wake boarding competitions	5	2.7
Boat drag races (IHBS)	4	2.2
Equestrian events/trail ride events	4	2.2
Outdoor concerts	2	1.1
Rodeos/horseshow events	2	1.1
Sailboat races (regattas)	2	1.1
Other (11 events, each mentioned once)	11	6.0
Other activities/facilities/services		
Playground area	3	1.6
Children's activities/youth programs	2	1.1
Volleyball	2	1.1
Water access/swimming for horse riders	2	1.1
Golf	2	1.1
Interpretive programs	2	1.1
Horseshoe pits	2	1.1
Rock climbing area	2	1.1
Others (10 activities/facilities, each mentioned once)	10	5.5

Note: About 80 percent or respondents checked the response stating "No, all the opportunities I wanted were offered" or left the question blank, which was recorded as a "no" response. Among the written responses given by the remaining 20 percent of respondents, about half mentioned activities already widely available in the Lake Oroville area or facility improvements unrelated to any new activity responses. The table does not include those responses, but the "percent of respondents" figures are based on all respondents who listed an activity or event, "new" or otherwise.
Source: Mailback Survey.

A handful of visitors made requests specific to camping, while a much larger group of requests was made, each mentioned by one to three people, for activities, facilities, or programs that could be associated with campgrounds or day use areas. Many of these were sports or games (volleyball, horseshoes, basketball, rock climbing).

A total of 18 different special events of interest to visitors were listed. Some of these have been and may occasionally continue to be hosted in the area, but visitors may not have been aware of them. Only four of the requests were made by more than a couple of visitors, primarily for competitive events they could participate in or watch. No special event was mentioned by more than six visitors, and 11 of the 18 were mentioned by only one respondent.

5.1.3.4 Visitors' Recreational Setting Preferences

In the Mailback Survey, respondents were asked about their preferences for five various aspects of the recreation setting at the recreation area where they were surveyed. For each aspect, visitors were asked to indicate their preference on a 4- to 7-point scale depending on the question. Each aspect contributes to the recreational experience at the study area, and included solitude/affiliation, risk and challenge, use of outdoor wilderness skills, presence of the sights and sounds of civilization, and appearance of the landscape. Together, these items describe a range of recreation settings from primitive, undeveloped, and low use to highly developed with high use levels. A range of recreation opportunities and experiences are available within the study area, although each resource area may not provide the full range of opportunities.

Table 5.1-19 shows respondent preferences for solitude versus affiliation with other groups. At all six resource areas, most visitors felt that either "solitude was important" or that "solitude and affiliation are equally important," with these two responses comprising from 57 to 71 percent of responses. The remaining responses tended toward a preference for solitude in most of the resource areas. This suggests that most respondents value opportunities to both be alone and to engage with other visitors, but with somewhat greater weight placed on opportunities for solitude. Given that relatively few visitors are alone when visiting the area (see Table 5.1-6), solitude may be taken to mean time spent with a visitor's own group but away from other groups.

Table 5.1-19. Visitors' preference for solitude or affiliation with other groups.

Rating	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Solitude is extremely important	12.4	16.7	5.8	15.1	4.5	14.9
Solitude is very important	15.2	10.0	7.7	12.9	13.5	10.5
Solitude is important	22.4	26.7	34.6	24.7	17.1	28.9
Solitude and affiliation are equally important	**34.3**	**40.0**	**36.5**	**36.6**	**46.8**	**40.4**
Affiliation with other groups is important	3.2	0.0	5.8	6.5	8.1	0.9
Affiliation with other groups is very important	2.2	3.3	7.7	0.0	2.7	2.6
Affiliation with other groups is extremely important	10.2	3.3	1.9	4.3	7.2	1.8

*Note: **Bold** type indicates the most frequent response for each area.*
Source: Mailback Survey.

Moving to the aspect of risk and challenge, about 70-80 percent of respondents at all resource areas felt that the opportunity to experience risk and challenge from the natural environment was at least "important" (the middle choice on the 5-point scale) and many considered this "very important" or "extremely important." Except at the OWA, about half of respondents surveyed in each area considered risk and challenge "very" or "extremely important" (Table 5.1-20). About 40 percent of OWA visitors expressed those preferences while about 30 percent indicated risk and challenge was only "somewhat important" or "not important." Overall, these responses demonstrate that respondents felt the opportunity for risk and challenge from the natural environment should be a part of the recreational experience to some degree in each part of the study area.

Table 5.1-20. Visitors' preference for opportunities for risk and challenge.

Rating	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Extremely important	**29.7**	**28.1**	**29.8**	**28.1**	27.0	24.6
Very important	22.4	24.0	21.1	24.0	20.9	15.6
Important	28.9	26.0	**29.8**	26.0	**31.3**	**29.5**
Somewhat important	11.9	16.7	8.8	16.7	11.3	15.6
Not important	7.1	5.2	10.5	5.2	9.6	14.8

*Note: **Bold** type indicates the most frequent response for each area.*
Source: Mailback Survey.

Visitors' ratings of the importance of the opportunity to use outdoor wilderness skills are shown in Table 5.1-21. Overall, the responses were similar to those for risk and challenge, with most responses in the "important" to "extremely important" portion of the scale. About 60-75 percent of respondents at each resource area rated this aspect of the setting as "important" or higher. However, the importance appears to be somewhat moderate as compared to risk and challenge, with the top response for each resource area "important" rather than "extremely important" as was the case for the preceding item. Responses of "somewhat important" and "not important" were higher for this item, in particular at the OWA, with about 25 to 40 percent giving those ratings to this item.

Overall, these responses indicate that respondents place some value on the opportunity to use outdoor wilderness skills as part of their recreational experience at the study area, although none of the study area is designated wilderness and most is developed to some degree.

Table 5.1-21. Opportunity to use outdoor wilderness skills.

	Resource Area					
Rating	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Extremely important	23.0	22.2	19.3	22.2	19.5	15.9
Very important	23.2	17.2	22.8	17.2	25.4	19.0
Important	**28.6**	**31.3**	**35.1**	**31.3**	**29.7**	**24.6**
Somewhat important	16.6	13.1	10.5	13.1	11.9	20.6
Not important	8.6	16.2	12.3	16.2	13.6	19.8

*Note: **Bold** type indicates the most frequent response for each area.*
Source: Mailback survey.

Another setting variable that Mailback Survey respondents were asked about was their preference for the sights and sounds of civilization. It should be noted that "sights and sounds of civilization" were not explicitly defined for respondents. Across all six resource areas, the greatest percentage of visitors felt these should be "rare," with a similar portion of respondents (36 to 41 percent) expressing this preference at each area (Table 5.1-22). About 60 to 70 percent of visitors in each area felt that the sights and sounds of civilization should be "unusual" or "rare." At the other end of the scale, about 20-30 percent of visitors preferred the sights and sounds of civilization to be "common" or "dominant" (responses of "dominant" were few). Overall, these responses indicate that most respondents prefer human intrusions to be fairly limited, although relatively few prefer them to be completely absent. Likewise, relatively few visitors prefer these features of the setting to be "common" or "dominant," although this preference is held by a substantial subset of visitors.

Table 5.1-22. Visitors' preference for the presence of the sights and sounds of civilization.

Preference	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Absent	13.5	19.4	12.5	19.4	7.8	15.3
Rare	**40.8**	**35.7**	**39.3**	**35.7**	**36.2**	**38.7**
Unusual	29.0	25.5	21.4	25.5	25.9	25.8
Common	16.0	18.4	21.4	18.4	29.3	19.4
Dominant	0.7	1.0	5.4	1.0	0.9	0.8

*Note: **Bold** type indicates the most frequent response for each area.*
Source: Mailback Survey.

The last setting variable that Mailback Survey respondents were asked to indicate their preferences for was landscape appearance. This aspect of the setting is closely related to the preceding sights and sounds of civilization item, thus similar responses would be expected. This is indeed the case; among the four landscape types offered, "predominantly natural in appearance" was the most frequent response, with between 45 and 59 percent of respondents in each survey site (Table 5.1-23). At most of the resource areas, the remaining responses primarily expressed a preference for a landscape "modified on a small scale." At the Diversion Pool and Forebay, the remaining preferences were fairly evenly divided between preference for a "totally natural" and a "modified on a small scale." Few respondents in any area listed "significantly modified" as their landscape preference.

Table 5.1-23. Visitors' preference for appearance of the landscape at recreation areas.

Preference	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Totally natural in appearance	16.0	24.2	21.4	24.2	10.3	19.0
Predominantly natural in appearance	**58.8**	**47.5**	**44.6**	**47.5**	**57.8**	**53.2**
Modified on a small scale	26.3	22.2	30.4	26.3	28.4	27.0
Significantly modified	2.9	2.0	3.6	2.0	3.4	0.8

*Note: **Bold** type indicates the most frequent response for each area.*
Source: Mailback Survey.

As a whole, visitors to the Lake Oroville area were fairly consistent in the preferences they expressed for aspects of the recreation setting and associated recreation opportunities. The dominant desire in all areas appears to be for recreation opportunities that allow for some degree of solitude and challenge in a predominantly natural setting. An interest does exist on the part of some visitors for opportunities that provide either more solitude, challenge, and more completely natural setting and, less so, for a more social and heavily developed setting, but these interests are in the

minority. The study area contains diverse enough conditions to meet most of these desires to some degree within most of the resource areas.

5.1.3.5 Visitors' Evaluation of the Number of Facilities Provided

Respondents to the Mailback Survey were asked to evaluate facilities at the recreation area where they were surveyed during their trip to the Lake Oroville area. A table listed 27 types of facilities grouped into five general categories: trail use related, camping related, boating related, fishing/hunting related, and other activity related. Respondents were asked to indicate whether the number of each type of facility was "too few," "about right," or "too many," with the option of marking "N/A" if they were uncertain or the type of facility did not apply to their recent experience. The question did not ask visitors to evaluate the quality or any other aspect of the facilities, only the number.

Responses to each item are summarized below by category (all "N/A" responses are disregarded). To facilitate presentation and discussion of these results, the tables report only the percent of respondents who evaluated a facility or service as "too few," which is of particular interest in assessing facility needs. For each of the 27 items, most other visitors checked "about right"; generally, less than 5 percent of responses for any item were "too many."

A few additional notes of explanation here may help in understanding these results, as summarized below.

First, there was a tendency for many respondents to check "too few" for many or all of the items in the table, perhaps without much consideration for actual need, potential use, appropriateness, etc. within the particular resource area. As a result, the percentages of "too few" responses tended to be high, often in the range of 30-60 percent, across resource areas. Given this response pattern, it suggests that the greatest attention should be paid to facilities evaluated as "too few" by a majority of respondents. The greatest weight should be given to the highest of such evaluations, typically over 70 percent of responses, which provide the strongest indication of perceived need. Also, emphasis should be placed on instances where a majority of visitors in one resource area evaluated an item as being "too few," while the majority felt the number was "about right" in the other resource areas.

Second, some responses are difficult to interpret in that they relate to types of facilities that do not currently exist (and may not be appropriate) in the resource area. For example, only non-motorized boats and boats with electric motors are permitted by the California Department of Parks and Recreation (DPR) on the Diversion Pool. Therefore, facilities and services to serve motorized boats, such as marinas and boat-in gas stations, do not exist (and would not be appropriate given current management). Most respondents checked "N/A" in these instances. However, some visitors evaluated these types of inappropriate facilities as "too few" in number. Perhaps less valid are the

evaluation of certain types of facilities as "too many" at areas where they do not currently exist. Some of these seemingly illogical responses may be from visitors who were incorrectly evaluating the item in reference to areas besides where they were surveyed.

Appendix H provides tables reporting all responses for all items for each of the six resource areas. This provides the opportunity to compare responses across items for each resource area within a single table, highlighting visitors' perceptions of the greatest facilities needs by area.

Trail Use Facilities

Visitors were asked to evaluate the number of five types of trail facilities: unpaved bike trails, paved bike trails, hiking trails, equestrian trails, and trail signs. With the exception of the OWA, relatively few visitors felt the number of various types of trails and trail signs were "too few." At the LFC in particular, less than 18 percent felt any of the trail facilities were "too few" in number. The evaluations given by visitors to Lake Oroville, Diversion Pool, Forebay, and Afterbay were similar, with about 20 to 40 percent "too few" responses. Although the greatest perception of need varied somewhat between areas, the number of signs indicating trail location was the top item at Lake Oroville and was close to the top at the other areas (Table 5.1-24). An increase in the number of equestrian trails appears to be the strongest interest at the Diversion Pool, while paved bike trails were most often evaluated as "too few" at the Forebay and Afterbay.

Table 5.1-24. Perception of trail facilities as "too few."

	Resource Area					
Type of Trail Facility	**Lake Oroville (%)**	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
Number of unpaved bike trails	32.6	31.8	8.0	20.9	26.3	51.9
Number of paved bike trails	34.8	20.0	16.0	**28.6**	**38.9**	59.1
Number of hiking trails	30.4	25.9	**17.4**	20.8	30.4	48.5
Number of equestrian trails	28.1	**42.9**	7.7	13.3	31.3	28.6
Number of signs indicating trail locs.	**39.2**	41.4	11.5	28.0	37.0	**70.0**

*Note: **Bold** type indicates the trail facility for each area with the highest percentage of respondents that marked "too few."*
Source: Mailback Survey.

Perceptions of trail needs were substantially higher at the OWA, where a majority of visitors felt that unpaved and paved bike trails and trail signs were "too few," and nearly 50 percent felt the number of hiking trails were "too few." With the exception of the number of equestrian trails, the perception that trail facilities were "too few" was highest

at the OWA, and the percentage of "too few" responses given by OWA visitors was generally 15-30 percent higher for each item than at the other areas.

Camping Facilities

Visitors were asked to evaluate seven types of camping facilities and services, including several types of campsites and camping amenities. Most of the camping facilities are within the study area at Lake Oroville, which provides developed family campgrounds for tent or RV campers, boat-in campsites, and floating campsites. RV campers are permitted to spend the night at the North Forebay DUA and Spillway BR/DUA parking lots. Only primitive camping facilities are available at the OWA, and the Afterbay provides no camping facilities.

Similar to the pattern described above for trails items, a strong majority of visitors at the OWA (60-90 percent) felt each type of camping facility was "too few" in number, with the exception of floating campsites (Table 5.1-25). (Floating campsites are present only at Lake Oroville and would not be appropriate for the OWA, where no reservoirs exist.) Although the percentages were considerably lower, a majority of visitors to the Afterbay also felt four of the seven types of camping facilities were "too few" in number.

Table 5.1-25. Perception of camping facilities as "too few."

Type of Camping Facility/Service	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Number of campgrounds	21.3	11.1	45.5	35.7	54.2	70.2
Number of campsites with RV hookups	38.1	22.2	33.3	**42.9**	47.1	84.0
Number of group campsites	33.0	0.0	**50.0**	31.8	57.9	69.7
Number of floating campsites	**47.6**	**40.0**	16.7	35.7	58.8	50.0
Screening between campsites	39.0	10.0	40.0	32.0	31.3	75.0
Number of shower facilities campgrounds	38.6	0.0	25.0	38.1	**66.7**	**90.9**
Presence of campground hosts	13.1	0.0	30.0	8.7	31.6	60.9

*Note: **Bold t**ype indicates the camping facility/service for each area with the highest percentage of respondents that marked "too few."*
Source: EDAW 2003 (Mailback Survey).

None of the eight camping facilities were evaluated as "too few" in number by more than 50 percent of visitors to Lake Oroville, Diversion Pool, LFC, or the Forebay. Nearly 50 percent of Lake Oroville visitors felt the number of floating campsites was "too few," the highest percentage for any item. The 40 percent who gave that response at the

Diversion Pool also appeared to express an interest in more floating campsites, although it is not clear if this is in reference to the Diversion Pool or Lake Oroville. The greatest perceived need for camping facilities at the Forebay appears to be campsites with RV hookups.

Boating Facilities

Visitors were asked to evaluate the number of five types of boating facilities including boat ramps, docks/temporary moorage, marinas, gas stations, and boat-in campsites.

At Lake Oroville, only the number of docks or temporary moorage was considered "too few" by a majority (58 percent) of visitors. About two thirds of visitors at the Diversion Pool also felt the number of docks or temporary moorage was "too few." Although not a majority, it is of note that the number of boat ramps was considered to be "too few" by 43 percent of Lake Oroville and Diversion Pool visitors (Table 5.1-26). (Each of the four primary developed boat ramps at Lake Oroville has from one to three docks. No boat ramps or docks are provided at the Diversion Pool.) Although the data appear to suggest a strong perception of need for a marina and gas station at the Diversion Pool, the percentages shown are based on only a few respondents. Most Diversion Pool visitors (78-84 percent) answered "N/A" for these items.

A majority of visitors to the Afterbay felt the number of marinas and the typically associated amenity of boat-in gas stations were "too few." (No marinas or refueling facilities are provided at the Afterbay.) About 44 percent also felt the number of docks or temporary moorage was "too few," perhaps due to the absence of docks at the Larkin Road car-top ramp.

Table 5.1-26. Perception of boating facilities as "too few."

Type of Boating Facility	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Number of boat ramps	43.4	42.9	21.7	13.2	27.3	30.8
Number of docks or temporary moorage	**57.7**	66.7	**41.7**	13.7	44.3	**57.7**
Number of Marinas	32.9	**80.0**	25.0	15.8	52.5	47.1
Number of boat-in gas stations	35.6	50.0	40.0	**42.9**	**54.5**	38.5
Number of boat-in campsites	45.2	33.3	25.0	27.8	35.7	56.5

*Note: **Bold** type indicates the boating facility for each area with the highest percentage of respondents that marked "too few."*
Source: Mailback Survey.

Visitors' perceptions of a need for additional boating facilities at the LFC and the Forebay appear to be low, with no more than about 43 percent of respondents considering any of the boating facilities to be "too few" in number. The greatest interest at those two areas appears to be for boat-in gas stations.

Lastly, a majority of OWA visitors felt the number of docks and boat in campsites was "too few." This may reflect the lack of a dock at the one ramp in the area, the gravel ramp near the Afterbay outlet. Boaters also use informal launch sites to access One-Mile Pond in the OWA, which also has no docks.

More in-depth analysis of these boating-related items is provided in Study R-7 – *Reservoir Boating*.

Fishing and Hunting Facilities

Evaluation of the number of fishing and hunting facilities included three items: fish cleaning stations, lands for hunting, and quality of habitat for hunting. Boat and bank angling are important activities in all six resource areas. Hunting within the study area primarily occurs in the OWA and the Afterbay resource area, which is managed as a subunit of the OWA. Hunting is not permitted at the LFC, Diversion Pool, and Forebay areas. Limited hunting is permitted in the Lake Oroville portion of the study area, in areas well separated from developed use areas.

Focusing first on the number of fish cleaning stations, the results indicate that from two-thirds to 90 percent of visitors to the Diversion Pool, LFC, and OWA who expressed on opinion felt there were "too few" of these facilities (Table 5.1-27). No fish cleaning stations are provided in those three areas. Several fish cleaning stations have been installed near boat ramps at Lake Oroville, the Forebay, and the Afterbay.

Table 5.1-27. Perception of fishing and hunting facilities as "too few."

Type of Fishing or Hunting Facility	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Number of fish cleaning stations	32.2	**66.7**	**73.9**	39.5	**43.5**	**89.7**
Lands for hunting	**40.0**	28.6	38.5	**53.3**	29.4	59.5
Quality of habitat for hunting	25.5	16.7	20.0	31.6	25.7	28.6

*Note: **Bold** type indicates the fishing/hunting facility for each area with the highest percentage of respondents that marked "too few."*
Source: Mailback Survey.

The meaning of the 53 percent of Forebay visitors and 60 percent of OWA visitors who felt that lands for hunting were "too few" is not clear. The presence of recreation

facilities as well as Project operations facilities at the Forebay and the small land base available preclude hunting there. On the other hand, most of the land within the OWA is available for hunting. The Hunter Survey (see Section 5.2) results provide more results specific to the OWA and this topic. Perceptions that quality habitat for hunting was "too few" were low across all six resource areas.

Other Facilities and Services

The final group of facility evaluation items included six types of day use and other specialized types of facilities and services.

A majority of Lake Oroville visitors felt two types of day use facilities were "too few" in number: swim areas and shoreline day use and picnic areas. These types of facilities were particularly scarce during the 2002 peak season, when the one developed swim area on the reservoir was unusable the entire season due to low water levels. Developed day use areas were also affected by low water levels in that the shoreline had receded far from the developed facilities above the high water line by mid-summer.

Half or more of visitors to the Diversion Pool felt four of the six facilities were "too few" (Table 5.1-28). In particular, two-thirds felt developed day use areas along the shore were "too few." The Diversion Pool DUA provides only road access vault toilets. Perceptions regarding swim areas may be in reference to other resource areas in that little swimming occurs at the Diversion Pool due to cold water temperatures.

Table 5.1-28. Perception of other facilities as "too few."

Type of Facility/Service	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Number of group picnic sites	33.9	26.7	38.2	17.9	45.7	**92.9**
Amount of swim areas	56.7	50.0	32.3	25.6	34.8	65.0
Number of equestrian facilities	25.2	50.0	13.3	19..4	41.2	61.1
Number of dev. day use or picnic areas along the shore	**66.6**	**66.7**	38.9	28.2	45.2	75.4
Number of interp. programs/educational opportunities	40.7	45.5	39.1	**40.6**	**53.3**	74.2
Number of restrooms	35.6	50.0	**42.6**	32.3	34.8	74.2

*Note: **Bold** type indicates the facility/service for each area with the highest percentage of respondents that marked "too few."*
Source: Mailback Survey.

At the Afterbay, only the number of interpretive programs and educational opportunities was felt to be "too few" by a majority of visitors. It may also be of note that over 45 percent of Afterbay visitors considered the number of group picnic sites and shoreline picnic sites to be "too few." The only developed day use site on the Afterbay, the picnic sites and beach at Monument Hill, is heavily used during the summer months.

Visitors to the OWA expressed a strong desire for more facilities of these types, with 61 to 93 percent of visitors considering the number of each type of facility to be "too few" in number. The interest appears to be greatest for group picnic sites, developed day use areas, interpretive programs, and restrooms.

5.1.3.6 Visitors' Perception of Management, Water Condition, and User Interaction Issues

The Mailback Survey asked visitors to indicate whether a series of 25 issues were a problem at the recreation area where they were surveyed during their recent visit. The 25 issues were organized into three general categories: Management, Water Conditions, and User Interactions. Respondents were asked to indicate whether each issue was a "big problem," a "moderate problem," a "slight problem," or "not a problem." As with the facilities evaluation above, respondents could check "N/A" if they were unsure or if the item did not apply to their visit. All N/A responses are disregarded in the information presented in this section.

Responses to each item are summarized below by category. To facilitate presentation and discussion of these results, the tables report only the percent of respondents who considered an issue to be a "moderate problem" or a "big problem" (a combined percentage), which is of particular interest in assessing management issues and visitors concerns. The range of perceptions is wide, both within resource areas and within issues. However, the percentage of visitors in each resource area who considered specific issues to be "moderate" or "big problems" was usually less than 20 percent. Issues that visitors appeared to have more concern about tended to have combined "moderate" and "big problem" response percentages of 30 to 50 percent, and just a few had percentages above 50 percent. The discussion focuses on resource areas and issues where at least 30 percent of visitors consider the issue to be a "moderate" or "big problem."

Appendix I provides tables reporting all responses for all items for each of the six resource areas. The appendix provides the opportunity to compare responses across items for each resource area within a single table, highlighting visitors' perceptions of the greatest problems by area.

Management Issues

Respondents were asked to assess 10 aspects of management of the Lake Oroville area in reference to the area where they were surveyed. The issues are primarily related to facility operation and maintenance responsibilities, including law enforcement, but also include items on access to the shoreline and cost to use facilities.

At Lake Oroville, access to the shoreline was the only one of the 10 management issues to be considered a "moderate" or "big problem" by more than 30 percent of visitors (Table 5.1-29). The percentage of these responses for each of the other nine issues was 15 percent or less. Similarly, only one issue was considered to be a "moderate" or "big problem" by more than 30 percent of visitors at the LFC: litter on the shoreline, with 41 percent of responses. About 24 percent of visitors considered the related issue of sanitation along the shoreline to be a "moderate" or "big problem."

Table 5.1-29. Perceptions of management issues as "moderate" or "big" problems.

Issue	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Litter along the shoreline	15.2	7.2	**41.1**	15.1	16.4	**74.0**
Sanitation along the shoreline	11.3	8.4	24.4	15.7	13.2	58.1
Cost to use facilities	6.6	7.4	7.3	2.3	4.4	4.9
Overall safety and security	9.8	7.2	12.5	5.4	13.3	20.9
Availability of service/staffing	10.1	0.0	5.7	7.0	**16.5**	20.6
Adequacy of info./ warnings provided	8.2	8.3	9.0	5.6	8.1	16.8
Adequacy of landscaping of facilities	9.5	0.0	10.7	5.4	10.5	22.7
Access to the shoreline	**33.2**	**12.0**	9.3	11.6	10.6	13.2
Law enforcement presence	12.7	10.0	7.9	**16.9**	9.1	29.4
Encounters between trail users and other users	2.8	7.2	7.9	1.4	4.1	9.6

*Note: **Bold** type indicates the issue for each area with the highest percentage of respondents that marked "moderate" or "big problem."*
Source: Mailback Survey.

Concern about these issues was low at the Diversion Pool, Forebay, and Afterbay, where none of the ten issues were considered "moderate" or "big problems" by more than 17 percent of visitors.

In contrast, visitors to the OWA expressed a very high level of concern about both litter and sanitation along the shoreline, with 74 percent and 58 percent, respectively

considering these to be "moderate" or "big problems." Nearly 30 percent considered law enforcement presence (presumably the lack of it) to be a "moderate" or "big problem." It is also notable that over 20 percent considered safety and security, availability of staffing and services, and adequacy of landscaping to be "moderate" or "big problems," substantially higher percentages than at most other areas.

Water Conditions

Visitors were asked to evaluate five water condition issues; three related to low water levels and water level fluctuations, along with water quality and floating debris issues. Water level fluctuation as a result of Project operations is a normal condition experienced by visitors every year. Low pool levels (elevations less than 800 feet) are present by late summer in drier years. Pool levels during the summer 2002 survey months, when most visitors were surveyed, were higher than they had been the previous summer but were lower than they had been the prior eight years (1993-2000).

Lake Oroville visitors expressed a high level of concern about three issues: exposed land during low water levels, shallow areas during low water levels, and water level fluctuations (Table 5.1-30). More than 54 percent considered exposed land to be a "moderate" or "big problem," and nearly 50 percent considered shallow areas and fluctuations to be so. The concerns appear to be similar among visitors to the Afterbay, although the greatest level of concern there seems to be shallow areas.

Table 5.1-30. Perceptions of water condition issues as "moderate" or "big" problems.

Issue	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Exposed land during low water levels	**54.5**	36.3	**30.0**	**23.0**	45.9	13.7
Shallow areas during low water levels	47.3	**38.1**	28.2	20.8	**52.7**	14.6
Floating debris on the water	26.4	36.4	21.8	21.6	14.2	**23.5**
Quality of water	11.2	4.3	10.6	17.0	14.3	9.8
Water level fluctuations	47.7	23.8	22.7	13.4	41.8	20.8

*Note: **Bold** type indicates the issue for each area with the highest percentage of respondents that marked "moderate" or "big problem."*
Source: Mailback Survey.

At the Diversion Pool, the percentage of visitors who considered exposed land and shallow areas at low water levels and floating debris on the water to be "moderate" or "big problems" was in the range of 36-38 percent. Although the question was intended to apply only to the area where the respondent was surveyed, these responses are assumed to relate to Lake Oroville, because pool level fluctuation and floating debris

generally do not occur on the Diversion Pool. The same is true of the responses for these items given by LFC and Forebay visitors. Relatively few visitors considered quality of water to be a "moderate" or "big problem" in any area.

User Interaction Issues

Visitors were asked to evaluate 10 issues related to other recreational users and their interactions with them. Three of the issues listed related to the number of watercraft present and the effects of boats on others. Four items related to encounters between different types of visitors and between visitors and residents. Lastly, three items related to the number of visitors at developed facilities and visitors' perception of unsafe behavior and use of alcohol by others.

With the exception of the OWA, less than one quarter of the visitors surveyed in each resource area considered any of the user interaction issues to be "moderate" or "big problems" (Table 5.1-31). At Lake Oroville, the highest percentage of visitors (22 percent) considered encounters between PWC and other users to be a "moderate" or "big problem." About 18 percent of visitors considered unsafe behavior by other users to be at least a "moderate problem." Fifteen percent of visitors or fewer considered any of the other issues to be a "moderate" or "big problem."

Table 5.1-31. Perceptions of user interaction issues as "moderate" or "big" problems.

Issue	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Numbers of watercraft	15.0	11.8	11.2	2.8	**22.7**	**38.3**
Noise from boats and personal watercraft	13.6	13.6	13.2	9.2	17.4	24.3
Boat speed or wake effects	14.5	13.3	14.3	10.7	16.5	28.4
Numbers of people at developed facilities	10.3	5.3	13.3	13.6	18.5	37.4
Encounters between water skier & others	9.6	13.4	7.7	7.2	6.5	4.3
Encounters between pleasure boaters and boat anglers	9.6	13.4	10.3	2.9	7.5	17.4
Encounters between PWC and other users	**22.4**	18.8	**15.3**	14.5	18.1	7.9
Unsafe behavior by other users	17.7	**23.8**	13.9	**19.5**	14.7	27.6
Use of alcohol by other users	8.4	0.0	11.9	12.0	10.4	26.3
Encounters between visitors and residents	2.7	0.0	5.0	2.4	2.2	13.2

*Note: **Bold** type indicates the issue for each area with the highest percentage of respondents that marked "moderate" or "big problem."*
Source: Mailback Survey.

The pattern of responses from Diversion Pool visitors was similar to Lake Oroville, with the same two issues most frequently identified as "moderate" or "big problems." However, the greatest perception of a problem existing was associated with unsafe behavior rather than PWC encounters. Motorized watercraft, including PWC, are not permitted on the Diversion Pool; thus, the responses related to PWC, water-skiing, boat speeds, etc. are not relevant to the Diversion Pool and must be assumed to relate to other resource areas. At the LFC, encounters between PWC and other users was the issue most frequently perceived to be a "moderate" or "big problem" (15 percent), although it is a relatively low percentage and PWC generally do not operate in that area.

About 20 percent of Forebay visitors considered unsafe behavior by other users to be a "moderate" or "big problem," while less than 15 percent held these perceptions about any of the other nine issues.

At the Afterbay, the issue of the number of watercraft was most often identified as a "moderate" or "big problem" (by 23 percent of visitors). Unlike the previous four resource areas, several other issues were considered "moderate" or "big problems" by only slightly less than 20 percent of visitors, including the number of people at developed facilities (19 percent) and encounters between PWC and other users (18 percent).

Responses given by OWA visitors indicate a substantially higher perception of user interaction problems at that area than for any of the other resource areas, with five of the ten issues considered to be a "moderate" or "big problem" by at least 25 percent of visitors. In particular, 38 percent of visitors considered the number of watercraft and 37 percent considered the number of people at developed facilities to be a "moderate" or "big problem." It is presumed that both of these results primarily relate to the Afterbay outlet area, where high numbers of anglers congregate both on shore and in boats at certain times of the year.

The 28 percent who considered boat speed and wake effects to be a "moderate" or "big problem" at the OWA was substantially higher than at any other resource area. About 28 percent also considered unsafe behavior by other users to be a "moderate" or "big problem," and nearly as many (26 percent) held that perception of alcohol use. It is notable that no more than 12 percent considered alcohol use to be a "moderate" or "big problem" at any other resource area.

5.1.3.7 Satisfaction with Overall Recreation Experience

The final question on the Mailback Survey asked respondents to rate their overall satisfaction with their recreation experience during their recent trip to the Lake Oroville area (the trip during which they completed the On-Site Survey). Respondents provided their rating by checking one of nine responses on a scale from "extremely dissatisfied" to "extremely satisfied." The responses were converted into numeric scores for

purposes of analysis, with “extremely dissatisfied” equal to a score of 1 and “extremely satisfied” equal to a score of 9.

The majority of respondents at each resource area were satisfied with their most recent trip to the Lake Oroville area (Table 5.1-32). The Diversion Pool had the highest percentage of “satisfied” to “extremely satisfied” respondents with almost 94 percent. This was also the only area where the most frequent response was “extremely satisfied” (36 percent of responses), an uncommon response at the other areas.

Table 5.1-32. Satisfaction with recent trip to Lake Oroville area.

Satisfaction Level	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
(1) Extremely Dissatisfied	3.9	0.0	3.8	2.1	2.6	2.4
(2) Very Dissatisfied	5.7	0.0	9.4	3.1	8.5	2.4
(3) Dissatisfied	3.7	3.2	1.9	1.0	0.9	3.2
(4) Somewhat Dissatisfied	5.2	0.0	7.5	3.1	6.0	8.0
(5) Neither Dissatisfied or Satisfied	3.3	0.0	1.9	6.2	4.3	8.0
(6) Somewhat Satisfied	7.8	3.2	13.2	5.2	8.5	12.0
(7) Satisfied	28.0	29.0	**32.1**	**40.2**	**33.3**	**36.0**
(8) Very Satisfied	**33.3**	29.0	17.0	29.9	27.4	20.8
(9) Extremely Satisfied	9.1	**35.5**	13.2	9.3	8.5	7.2
Mean satisfaction rating	6.6	7.8	6.3	6.9	6.5	6.4

*Note: **Bold** type indicates the most frequent response for each area.*
Source: Mailback Survey.

At Lake Oroville, the one-third of visitors who rated their level of satisfaction as “very satisfied” represented the largest response group. Nearly as many indicated they were “satisfied” with their visit, and over 70 percent gave a rating of “satisfied” or better.

At the LFC, Thermalito Forebay, Thermalito Afterbay, and OWA, the largest percentage of visitors gave a rating of “satisfied,” and between 62 and 79 percent of respondents rated their level of satisfaction between “satisfied” and “extremely satisfied.”

On the opposite side of the scale, only three to six percent of respondents at the Thermalito Forebay and Diversion Pool and eight to15 percent at Lake Oroville, LFC, Thermalito Afterbay, and OWA rated their level of satisfaction as “dissatisfied” or worse.

Mean satisfaction ratings for all areas, with the exception of the Diversion Pool, were between 6.3 and 6.9 (between “somewhat satisfied” and “satisfied”). The mean rating of 7.8 for the Diversion Pool corresponds to rating close to “very satisfied.”

Table 5.1-33 presents two comparisons of overall satisfaction, ratings given by peak season versus non-peak season visitors and rating given by residents of Butte and adjacent counties ("local" visitors) versus rating given by residents of other counties and states ("tourist" visitors).

Peak season and non-peak season visitors differed only slightly in their overall satisfaction with their trip to the Lake Oroville area, with more "very" and "extremely satisfied" visitors during the non-peak season. The mean satisfaction score given by non-peak season visitors was only about 0.3 points higher than the peak season score, with both scores between "somewhat satisfied" and "satisfied." The pattern of responses given by residents of Butte and adjacent counties as compared to residents of other counties was very similar to this, with somewhat more "tourists" than "locals" indicating they were "very" or "extremely satisfied." As was the case for the prior two groups, mean satisfaction scores were similar and fell between "somewhat satisfied" and "satisfied."

Table 5.1-33. Comparison of overall satisfaction, by season of survey and residence of respondent.

	Survey Season		Visitor Residency	
Satisfaction Level	Peak Season (%)	Non-peak Season (%)	Butte & Adj. Counties (%)	Other Counties (%)
(1) Extremely Dissatisfied	2.9	5.2	3.9	2.6
(2) Very Dissatisfied	5.8	3.5	5.6	5.4
(3) Dissatisfied	3.1	2.3	3.4	2.3
(4) Somewhat Dissatisfied	5.7	4.0	4.9	6.7
(5) Neither Dissatisfied or Satisfied	4.3	2.9	4.9	2.8
(6) Somewhat Satisfied	8.8	5.8	7.8	8.8
(7) Satisfied	**31.4**	28.3	**34.1**	25.6
(8) Very Satisfied	29.4	**32.4**	26.9	**34.5**
(9) Extremely Satisfied	8.7	15.6	8.6	11.1
Mean satisfaction rating	6.5	6.8	6.5	6.7

*Note: **Bold** type indicates the most frequent response for each area.*
Source: Mailback Survey.

A final comparison of visitors' overall satisfaction with their visit focuses on the rating given by five different primary activity groups. Most Mailback Survey respondents had indicated on the On-Site Survey what their primary activity was during their visit (see Table 5.1-1). The respondents were divided into groups reflecting the prominent types of activities available within the study area, including boating, fishing, trail use, camping, and other day use (non-boating, fishing, or trail use visitors). The boating group included those whose primary activity was one of the nine motorized and non-motorized boating activities listed on the On-Site Survey. The fishing group included both bank and boat anglers. The trail use group included the three main types of trail users

(hikers, bike riders, and horseback riders), as well as dog walkers. Campers included tent, RV, and floating campsite campers. Finally "other day user" included those whose primary activity was one of 11 day use activities. However, nearly half of the respondents in this group indicated their primary activity was swimming, and most of the remainder listed picnicking or relaxing as their primary activity.

The results of this comparison suggest that a consistent moderate to high level of satisfaction exists across the primary activity groups (Table 5.1-34). The most frequent rating given by all groups was "satisfied" or "very satisfied," and from 63 to 83 percent of each group was "satisfied" to "extremely satisfied" with their experience. Mean satisfaction ratings were between 6.4 and 6.7 for the camping, boating, fishing, and other day use groups. Satisfaction was particularly high among members of the trail use primary activity group, about 60 percent of whom indicated they were "very" or "extremely satisfied" with their experience. The mean satisfaction rating given by the trail use group was 7.3, from about half a point to nearly a full point higher than the other groups.

Table 5.1-34. Satisfaction with recent trip to Lake Oroville area.

Satisfaction Level	Primary Activity Group				
	Boating (%)	**Fishing (%)**	**Trail Use (%)**	**Camping (%)**	**Other Day Use[1] (%)**
(1) Extremely Dissatisfied	3.9	2.4	2.1	4.3	3.4
(2) Very Dissatisfied	6.9	4.5	3.1	4.3	5.1
(3) Dissatisfied	3.6	3.6	1.0	0.0	3.4
(4) Somewhat Dissatisfied	3.3	9.3	1.0	10.6	6.8
(5) Neither Dissatisfied or Satisfied	2.4	6.5	3.1	0.0	5.1
(6) Somewhat Satisfied	6.0	10.9	7.2	6.4	10.7
(7) Satisfied	29.9	**32.0**	22.7	**34.0**	**33.9**
(8) Very Satisfied	**36.0**	22.7	**39.2**	29.8	24.3
(9) Extremely Satisfied	7.9	8.1	20.6	10.6	7.3
Mean satisfaction rating	6.6	6.4	7.3	6.7	6.4

1. The "Other Day Use" group included those whose primary activity was one of the eight "passive" activities listed on the survey, not including RV camping, in addition to those whose primary activity was nature study, bird watching, swimming, or panning for gold. However, 83 percent of this group listed swimming, relaxing, or picnicking as their primary activity.
Note: The primary activities groups include 30 of the 42 activities listed on the survey and 920 of 1,071 Mailback Survey respondents (86 percent). About 10 percent of respondents did not indicate a primary activity. The remaining 4 percent listed one of the remaining 12 activities (primarily "urban" activities such as movies and shopping and activities not available within the study area such as golf or tennis) as their primary activity. ***Bold*** *type indicates the most frequent response for each area.*
Source: Mailback Survey.

5.1.4 Regional Recreation

Because the Northern California region provides many lakes, reservoirs, and rivers that supply many of the same types of recreation opportunities available within the study area, it is likely that many visitors to the study area visit some of these other recreation sites. Mailback Survey respondents were therefore asked whether they had visited any of 30 regional recreation destinations for recreation in the past 12 months, and if they had visited any of those sites during their recent trip to the Lake Oroville area. The first question provides an indication of the most popular substitute recreation sites in the region. The second question provides an indication of whether the Lake Oroville area is the sole destination for visitors or whether it is one stop among two or more on a typical trip. Respondents could list other sites not listed on the survey booklet.

Table 5.1-35 lists the percentages of respondents who had visited each location listed on the survey. The Sacramento River and San Francisco Bay/Delta area were among the top five places visited by respondents at each resource area. Lake Tahoe was one of the top five destinations listed by respondents at all survey sites except the Forebay (and was just outside the top five there). Lake Almanor (a top five location of respondents at Lake Oroville, the Diversion Pool, the Forebay, and Afterbay) and the North Fork of the Feather River (Lake Oroville, LFC, Forebay, and Afterbay) were also popular destinations visited by respondents. While it was among the top five responses at only two sites, it is notable that Bucks Lake was cited as a recent destination by nearly one-third of respondents at the LFC and over one quarter at the Forebay.

Table 5.1-35. Other Northern California recreation areas Lake Oroville area visitors had visited within the last 12 months.

Location	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Lake Almanor	**26.3**	**28.1**	22.4	**36.3**	**33.6**	20.8
Butt Valley Lake	4.0	0.0	3.4	6.1	5.0	3.8
San Francisco Bay/Delta	**38.3**	**25.0**	**37.9**	**37.4**	**34.5**	**44.6**
Bucks Lake	15.4	12.5	**32.8**	**26.2**	11.8	10.8
Eagle Lake	8.4	9.4	10.3	11.1	5.9	13.1
Lake Davis	3.7	0.0	0.0	2.0	1.7	8.5
Little Grass Valley Reservoir	10.6	9.4	20.7	6.1	14.3	6.2
Honey Lake	0.5	3.1	1.7	1.0	0.0	1.5
Lake Britton	2.1	0.0	3.4	1.0	0.8	1.5
Shasta Lake	21.0	15.6	12.1	12.1	19.3	15.4
Lassen NF rivers and lakes	9.8	**25.0**	13.8	18.2	8.4	12.3
Plumas NF rivers and lakes	13.5	**21.9**	13.8	14.1	12.6	13.8
Middle Fork Feather River	21.0	**21.9**	**27.6**	21.2	15.1	**21.5**
South Fork Feather River	20.8	9.4	22.4	19.2	16.0	9.2
North Fork Feather River	**22.7**	15.6	**29.3**	**29.3**	**22.1**	19.2
Sacramento River	**32.7**	**34.4**	**37.9**	**30.3**	**35.3**	**55.4**

Table 5.1-35. Other Northern California recreation areas Lake Oroville area visitors had visited within the last 12 months.

Location	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Yuba River	8.6	15.6	**25.9**	14.1	17.6	**23.8**
Pit River	1.6	3.1	3.4	3.0	0.8	4.6
Lake Tahoe	**38.6**	**31.3**	**27.6**	25.3	**28.6**	**32.3**
Trinity Lake	4.8	6.3	3.4	3.0	2.5	8.5
Lassen Volcanic Nat'l Park	12.2	18.8	12.1	21.2	6.7	8.5
Lake Berryessa	14.4	3.1	1.7	8.1	9.2	10.8
Folsom Lake	17.8	**21.9**	6.9	9.1	8.4	**22.3**
South Fork American River	6.8	15.6	5.2	4.0	3.4	19.2
Stony Gorge Reservoir	4.6	3.1	6.9	9.1	7.6	2.3
Black Butte Lake	9.8	**28.1**	10.3	13.1	16.8	10.8
Antelope Lake	2.1	3.1	3.4	4.0	1.7	3.1
Frenchman Lake	1.4	0.0	0.0	3.0	0.0	3.8
Whiskeytown Lake	7.1	15.6	8.6	9.1	8.4	7.7
Lower Feather River	13.3	18.8	**29.3**	19.2	21.8	41.5

*Note: **Bold** indicates the top five locations visited. In some cases, more than five locations are bolded due to equal percentages of respondents.*
Source: Mailback Survey.

While many respondents had visited other recreation destinations within the last year, the majority of respondents did not visit other places on their last trip to the Lake Oroville area (Table 5.1-36). Between 71 percent and 89 percent of respondents (for all resource areas) did not travel to any other destination during their recent trip to the Lake Oroville area.

Table 5.1-36. Other places visited on last trip to the Lake Oroville area.

Response	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Did you visit any other places on your recent trip to the Lake Oroville area?						
Yes	14.1	18.8	20.7	17.2	10.8	29.2
No	**85.9**	**81.2**	**79.3**	**82.8**	**89.2**	**70.8**

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

Of those who did visit other places, the places visited most often mentioned included: Lake Almanor, Shasta Lake, Little Grass Valley Reservoir, Lake Tahoe, and Bucks Lake. Each of these, with the exception of Lake Tahoe, is a medium to large foothill or mountain reservoir located to the north or east of the study area. Lake Tahoe is a large natural body of water and well known regional and national recreation destination located a few hours drive to the south of the study area. Each of these had been visited by three to four percent of those from all five resource areas combined, who had visited

other areas during their recent Lake Oroville area trip. Percentages associated with individual resource areas and substitute sites were very small and are not provided in the table.

5.1.5 Fishing Sub-section of the On-Site Survey

Fishing is among the more popular recreation activities in the study area. Respondents at each of the survey sites who had fished or who expected to fish in the area during their current trip were asked a series of on-site questions about the following subjects: previous fishing visits to Lake Oroville; fishing outfitter or guide use; fishing tournament participation; perception of crowding at fishing areas; species of fish sought while fishing and fish caught; time spent fishing; perceptions of fishing regulations; and satisfaction with fishing experience. A total of 1,070 of the 2,583 On-Site Survey respondents (41 percent) completed all or part of the fishing sub-section.

5.1.5.1 Past Fishing Activity in the Lake Oroville Area

At least 80 percent of the respondents at each resource area had fished in the Lake Oroville area before (Table 5.1-37), although between 21 and 42 percent of those had not fished there within the last year. Of the respondents who had fished at the Lake Oroville area within the last year, most have fished multiple times; between 45 and 58 percent of respondents at each resource area had fished four or more times at the Lake Oroville area within the last year, and most of the remainder fished two or three times. The Diversion Pool and Forebay had the highest percentage of frequent anglers, those who had fished between 11 and 25 times within the last year or more than 25 times (36 and 35 percent, respectively). In contrast, over 40 percent of LFC anglers had not fished at the Lake Oroville area within the last 12 months.

5.1.5.2 Use of Fishing Guides and Participation in Fishing Tournaments in the Lake Oroville Area

The vast majority of respondents, more than 90 percent at most of the resource areas, had not used a fishing outfitter or guide in the Lake Oroville area in the last 12 months (Table 5.1-38). The Forebay had the highest percentage of respondents who had used an outfitter or guide (14 percent), and Lake Oroville had the lowest percentage (about 6 percent).

Relatively few fishing section survey respondents had participated in a fishing tournament in the last 12 months (Table 5.1-39). At Lake Oroville, where the majority of the fishing tournaments within the study area take place, only 17 percent of respondents indicated that they had participated in a tournament in the previous year. Most tournaments are bass tournaments, with the most commonly mentioned by survey respondents being the Chico Bass, New Bass, Angler's Choice, Won Bass, Western

Bass, and American Bass Association tournaments. The percentage of respondents who had participated in a fishing tournament in the previous year was lowest at the Forebay (1 percent).

Table 5.1-37. Previous fishing visits to Lake Oroville.

Response	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Have you fished at Lake Oroville before?						
Yes	**87.0**	**84.6**	**80.6**	**84.9**	**81.8**	**85.9**
No	13.0	15.4	19.4	15.1	18.2	14.1
If yes…How many times over the past 12 months?						
0	**28.1**	21.4	**41.6**	23.4	**30.8**	**25.9**
1-3	26.0	**28.6**	20.8	19.1	18.7	24.1
4-6	12.6	7.1	18.2	12.8	15.3	16.6
7-10	8.2	7.1	6.5	9.6	8.8	8.6
11-25	13.2	28.5	7.8	**23.5**	15.4	14.1
>25	11.4	7.1	5.2	11.8	12.1	10.9

*Note: **Bold** type indicates the most frequent response/response category for each area.*
Source: On-Site Survey.

Table 5.1-38. Fishing outfitter or guide use in the study area.

	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Have you used a fishing outfitter or guide in the Lake Oroville area in the last 12 months?						
Yes	5.8	8.3	8.2	13.6	9.5	9.8
No	**94.2**	**91.7**	**91.8**	**86.4**	**90.5**	**90.2**

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

Table 5.1-39. Fishing tournament participation.

	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Have you participated in fishing tournaments in the Lake Oroville area in the last 12 months?						
Yes	16.8	7.7	6.8	1.1	8.1	2.2
No	**83.2**	**92.3**	**93.2**	**98.9**	**91.9**	**97.8**

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.5.3 Perceptions of Crowding at Fishing Areas

Anglers were asked to rate the level of crowding they perceived at the area where they fished on the day they were surveyed, using a nine-point scale-type question identical in form to the recreation site crowding question discussed earlier (see Table 5.1-15).

Respondents surveyed at the Diversion Pool felt the least amount of crowding, with 80 percent indicating that they felt the area where they fished was "not at all crowded" (Table 5.1-40) and all remaining respondents rating crowding only slightly above "not at all crowded" (2 on the 9-point scale).

The anglers at each of the other resource areas, with the exception of the OWA, were also most often considered the areas where they fished to be "not at all crowded." Well above a majority of respondents at Lake Oroville (76 percent) and at the LFC (72 percent), Forebay (74 percent), and Afterbay (63 percent) indicated that their respective fishing areas were "not at all crowded" to "slightly crowded" (1 to 3 on the nine-point scale).

Many respondents surveyed in the OWA felt considerably more crowded. Although responses were fairly well distributed across the scale, the most common response was "moderately crowded," and about 54 percent of respondents felt the area where they fished was "moderately" to "extremely crowded." The mean crowding score for the OWA fishing areas also highlights the increased perception of crowding in that area, with the mean score of 5.3 being 2 to 4 points higher on the scale than the other resource areas.

Table 5.1-40. Perception of crowding at fishing location.

	Resource Area					
Crowding Rating	**Lake Oroville (%)**	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
1 – Not at all crowded	**47.4**	**80.0**	**49.2**	**48.4**	**34.3**	7.3
2	12.9	20.0	13.1	9.7	13.4	8.0
3 – Slightly crowded	15.4	0.0	9.8	16.1	14.9	16.0
4	5.6	0.0	3.3	6.5	4.5	4.7
5	4.7	0.0	6.6	4.8	10.4	10.5
6 – Moderately crowded	8.4	0.0	13.1	6.5	9.0	**22.9**
7	2.3	0.0	1.6	0.0	6.0	9.1
8	0.9	0.0	1.6	1.6	3.0	5.5
9 – Extremely crowded	2.3	0.0	1.6	6.5	4.5	16.0
Mean score	2.6	1.2	2.7	2.8	3.4	5.3

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.5.4 Fish Species Sought and Fish Caught in the Lake Oroville Area

Anglers were asked to complete a table in which they would indicate the fish species they were fishing for (11 species were listed, along with "other" and "no preference"), the number of fish caught of each species within five size categories, and the number of each species released. For trout, salmon, and steelhead, anglers were also asked to indicate the number of fish caught with clipped and unclipped adipose fins (hatchery raised fish have their fins clipped, enabling them to be distinguished from wild fish).

Fish Species Sought

Black bass, trout, and salmon were the fish species most sought after by anglers in the study area (Table 5.1-41). Most anglers were fishing for just one species, and usually just one or two species dominated the fishing in each resource area. There were very few anglers fishing for shad or sturgeon at any of the resource areas. Striped bass and crappie were also pursued by relatively few anglers.

Table 5.1-41. Species of fish anglers were fishing for in the Lake Oroville area.

Species of Fish	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Black bass	**59.5**	**57.1**	20.6	13.9	**42.3**	3.3
Sunfish	5.7	0.0	17.6	8.3	5.8	2.8
Catfish	10.1	14.3	17.6	13.9	9.6	4.2
Crappie	5.1	0.0	5.9	5.6	3.8	2.3
Trout	12.7	42.9	20.6	**72.2**	13.5	7.5
Salmon	10.4	28.6	**55.9**	16.7	**42.3**	**70.9**
Steelhead	1.9	0.0	8.8	5.6	7.7	23.0
Striped bass	8.2	0.0	2.9	8.3	5.8	1.4
Shad	0.3	0.0	2.9	2.8	0.0	1.4
Green sturgeon	0.3	0.0	0.0	5.6	0.0	1.4
White sturgeon	0.6	0.0	0.0	5.6	0.0	0.9
Other	6.0	0.0	0.0	2.8	0.0	4.7
No preference	2.5	0.0	0.0	5.6	0.0	0.0
Fishing for 1 species	**69.8**	**57.1**	**72.7**	**77.1**	**80.9**	**83.0**
Fishing for 2+ species	30.2	42.9	27.3	22.9	19.1	17.0

Note: Respondents could indicate more than one species they were fishing for. About 39 percent of anglers did not complete the table that provided information on the species sought; about half of those who did not complete the table did not list the time that they fished, and so may not have fished on the survey day. Visitors who had not fished that day were asked to skip the table. Among the anglers who did complete the "fish caught" portion of the table, about 11 percent did not indicate the species they were fishing for. ***Bold*** *type indicates the species for each area with the highest percentage of anglers fishing for that species.*
Source: On-Site Survey.

At Lake Oroville, respondents were primarily fishing for black bass, although 10-13 percent were fishing for catfish, striped bass, trout, or salmon. Diversion Pool anglers were also most often fishing for black bass (57 percent), but trout fishing was also common (43 percent). Salmon fishing was third most common among anglers surveyed at the Diversion Pool, with about 29 percent of respondents

Salmon was the most popular species for anglers at the LFC and the OWA, the two resource areas through which the Feather River flows and where many visitors are attracted during the salmon runs. Trout and several of the warmwater species were also pursued by 18-21 percent of anglers surveyed at the LFC. At the OWA, steelhead was the second most frequently fished for species.

Trout was the main species being fished for at the Forebay, with over 72 percent of anglers fishing for that type of fish. From 14 to 17 percent fished for salmon, black bass, or catfish. At the Afterbay, equal percentages of anglers (42 percent) indicated they were fishing for the two most popular species, black bass and salmon. About 14 percent were fishing for trout. As shown by these results, the Forebay and Afterbay provide both a cold and warmwater fishery, with warmwater species like black bass a more important component of fishing opportunities at the Afterbay.

Although most of the fishing activity summarized above would have occurred in the resource area where the surveys were conducted, it is important to note that anglers may have fished in other resource areas besides where they were surveyed, and this may have affected the data reported. At the LFC, in particular, substantial numbers of anglers mentioned fishing for warmwater species that generally do not comprise part of the fishery in the river.

Number of Fish Caught and Released

The number of fish caught by anglers in each area covered a wide range, from none caught to several dozen caught (Table 5.1-42). At Lake Oroville in particular, although about 27 percent of anglers did not indicate that they had caught any fish, most anglers had caught several fish and nearly one-fourth had caught more than 10 fish. In part due to the relatively high number of anglers who caught more than 10 fish, the average number of fish caught was about 7.0, a much higher average than at the other resource areas.

At the Diversion Pool, Forebay, Afterbay, and OWA, about 40 to 50 percent of anglers did not indicate that they had caught any fish while about 23-31 percent had caught from two to five fish. At each of these areas, about 14-17 percent had caught a single fish and similar percentages had caught more than five fish. The average number of fish caught at each of the areas was between about two and three fish. The LFC differed from the other resource areas in that nearly 62 percent of anglers did not catch any fish. Similar to the other areas, about 21 percent had caught between two and five fish, while about 12 percent had caught more than five fish. Due to the high percentage of anglers who had caught no fish, the average number caught was lower than the other areas, at 1.4 fish.

Table 5.1-42. Number of fish caught by anglers in the Lake Oroville area.

Number of Fish Caught	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
0	**26.9**	**42.9**	**61.8**	**50.0**	**42.3**	**38.5**
1	10.4	14.3	5.9	13.9	17.3	15.5
2-5	25.9	28.6	20.6	25.1	23.0	31.0
6-10	12.7	14.3	2.9	5.6	9.6	8.5
>10	24.1	0.0	8.7	5.6	7.6	6.6
Mean	7.0	2.1	1.4	2.5	2.7	2.8

Note: Data include all species and size categories. About 39 percent of anglers did not complete the table that provided information on the number of fish caught. At Lake Oroville, LFC, and OWA, several anglers indicated they had caught more than 50 and as many as 371 fish. The calculations of the mean number of fish caught for those areas ignored cases with more than 50 fish caught. ***Bold*** *type indicates the most frequent response category for each area.*
Source: On-Site Survey.

Because few anglers who indicated that they caught salmon, trout, or steelhead indicated how many of the fish had clipped or unclipped adipose fins, these data cannot be considered reliable and so are not reported.

Black bass was the species of which the greatest numbers were caught, with more than 3.5 times as many caught as any other species (Table 5.1-43). A majority of those fish were in the 12-20 inch size class, and most of the remainder were less than 12 inches in length. Less than five percent of the black bass caught were larger than 20 inches. Although a relatively high number of black bass were caught, the anglers surveyed indicated that about 85 percent of those fish were released. (The bass slot limit in effect at Lake Oroville requires anglers to immediately release all bass between 12 and 15 inches in length).

Lake Oroville area anglers indicated they had caught over 600 salmon, the second most prominent species pursued in the study area. The fish caught tended to be in the larger size classes, with more than one-third in the largest size class of 31 inches and larger. Unlike the black bass caught, only about one-third of the salmon caught were released. Trout were the third most frequently caught species, with 269 caught, less than half the number of salmon caught, and about 30 percent released. The number of fish caught of the other prominent coldwater fish species, steelhead, was an even fewer 149, with over 90 percent released. Steelhead caught tended to be larger fish, while the trout tended to be from the smaller size classes. Several hundred sunfish and catfish were caught, with 45 and 38 percent released, respectively. Sunfish tended to be smaller fish, primarily less than 12 inches, while the catfish caught included both smaller and moderately sized fish, along with a few larger examples.

Table 5.1-43. Number of fish caught and released in the Lake Oroville area by species and size.

Species of Fish	Size Class (inches)					Total Caught	Total Released
	0-5	6-11	12-20	21-30	31+		
Black bass	136	658	1,311	100	1	2,206	1,881
Sunfish	154	66	26	1	0	247	112
Catfish	105	22	87	9	8	231	88
Crappie	9	37	7	0	0	53	19
Trout	11	107	120	0	31	269	81
Salmon	32	9	179	164	218	602	211
Steelhead	19	19	53	49	9	149	137
Striped bass	32	27	28	18	0	105	15
Shad	2	30	0	0	0	32	26
Green sturgeon	0	0	0	0	4	4	0
White sturgeon	0	1	2	0	3	6	0

Note: About 39 percent of anglers did not complete the table that provided information on the number of fish caught; about half of those who did not complete the table did not list the time that they fished, and so may not have fished on the survey day. Visitors who had not fished that day were asked to skip the table.
Source: On-Site Survey.

5.1.5.5 Perceptions of Fishing Regulations

Generally, 80 to 90 percent of respondents at each survey area felt that they were knowledgeable about fishing regulations (Table 5.1-44). The highest percentage of respondents who did not feel knowledgeable about fishing regulations was at the LFC (20 percent). Similarly, 84 to 92 percent of respondents felt that the fishing regulations allowed a quality recreation experience. The only area where more than 10 percent of respondents felt that the fishing regulations do not allow a quality recreation experience was the Forebay (16 percent).

Table 5.1-44. Lake Oroville area anglers' perceptions of fishing regulations.

Response	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Do you feel knowledgeable about fishing regulations?						
Yes	**89.3**	**100.0**	**80.3**	**84.4**	**83.3**	**89.3**
No	10.7	0.0	19.7	15.6	16.7	10.7
Do you feel fishing regulations allow a quality recreation experience?						
Yes	**92.4**	**100.0**	**90.1**	**84.3**	**91.5**	**91.4**
No	7.6	0.0	9.9	15.7	8.5	8.6

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.5.6 Satisfaction with Fishing Experience

About three quarters to over 90 percent of anglers from each resource area were satisfied with their fishing experience at the Lake Oroville area (Table 5.1-45). The area with the highest percent of satisfied respondents was the Diversion Pool, with about 91 percent of respondents who were satisfied. The lowest rate of angler satisfaction (72 percent) was recorded at the Afterbay.

Table 5.1-45. Satisfaction with fishing experience.

Response	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Overall, are you satisfied with your fishing experience at the Lake Oroville Area on this trip?						
Yes	**75.6**	**90.9**	**76.9**	**80.3**	**72.2**	**82.4**
No	24.4	9.1	23.1	19.7	27.8	17.6

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

The most common reason for being dissatisfied with the fishing experience at all areas was not catching any or enough fish (Table 5.1-46) (refer to Section 5.1.5.5 for catch rates). This was the reason given by at least half of the dissatisfied anglers at all of the areas with the exception of the Afterbay and OWA and by 100 percent of dissatisfied Diversion Pool anglers (one respondent). Although anglers' high interest in fishing success in not unexpected, their success is likely affected by many factors unrelated to Project area operations or management, such as timing of fishing effort, weather, knowledge and skill of the angler, equipment, and many other factors.

Other reasons given by anglers for being dissatisfied with their fishing experience related more directly to site conditions. At Lake Oroville, most reasons given (beyond not catching enough fish) related to low pool levels. Reasons related to social or physical conditions, such as crowding or shoreline litter, were few. At the LFC, most other reasons cited by the 15 anglers who were not satisfied were low Lake Oroville pool levels (not low flows in the river), other visitors with dogs, and discourteous and illegal fishing practices.

A few of the 15 anglers surveyed at the Forebay and the 20 surveyed at the Afterbay who were not satisfied mentioned competition for fishing space, and a few additional anglers at the Afterbay mentioned low reservoir levels and Afterbay outlet flows. Among the minority of dissatisfied anglers at the OWA (49 of 249 anglers), crowding was again a prominent reason given. Other concerns expressed about fishing conditions at the OWA were mainly related to litter in riverbank areas, dirty restrooms, rude and discourteous behavior by other anglers, and illegal fishing (e.g., snagging).

Table 5.1-46. Reasons anglers were dissatisfied with fishing experience.

Reason for Dissatisfaction	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Did not catch any/ enough fish	**60.6**	**100.0**	**53.8**	**50.0**	**44.4**	**37.0**
Lake level too low/ flow too low	25.3	0.0	15.4	0.0	16.7	6.5
Fish too small	9.1	0.0	0.0	0.0	5.6	0.0
Too crowded	2.0	0.0	0.0	14.3	22.2	17.4
Poor access	2.0	0.0	7.7	7.1	0.0	2.2
Other visitors (rude, discourteous behavior)	0.0	0.0	15.4	7.1	0.0	10.9
Poor site conditions (garbage, bees, dirty bathrooms, etc.)	2.0	0.0	0.0	0.0	11.1	15.2
People illegally fishing	0.0	0.0	7.7	0.0	0.0	10.9
Other/Reason unclear	7.1	0.0	7.7	21.4	0.0	8.7

Note: Responses are from only those respondents who completed the fishing section of the survey and answered that they were not satisfied with their fishing experience. Some respondents gave more than one reason for their dissatisfaction. The response format for this question was open-ended. ***Bold*** *type indicates the most frequent reason for dissatisfaction for each area.*
Source: On-Site Survey.

5.1.6 Trail Use Sub-section of On-Site Survey

Lake Oroville area visitors who had used or expected to use trails during their visit were asked to complete a trail-related sub-section of the On-Site Survey booklet. The respondents were non-motorized trail users – namely, bike riders, hikers/walkers, and equestrian riders – rather than motorized trail users such as ORV users. Specifically, they were asked about their primary type of trail use, previous use of area trails, perceptions of trail crowding, encounters on trails in which they were put at risk, overall satisfaction with the condition of Lake Oroville area trails, and their favorite trail or trail section in the Lake Oroville area.

A total of 991 of the 2,583 On-Site Survey respondents (38 percent) completed the trail use section. It is important to note that trail users were not limited to those who used the developed, named trails in the study area, such as the Dan Beebe and Brad P. Freeman trails. Although those trails probably account for most trail use in the area, visitors also use unofficial trails, particularly to reach reservoir and river shorelines, in various locations within the study area.

5.1.6.1 Primary Type of Trail Use and Past Trail Use

Respondents were asked to identify their primary type of trail use in the Lake Oroville area: biking, hiking/walking, equestrian riding, and other. Hiking and walking were the

most popular trail use of visitors at all survey sites except for the Diversion Pool, where the overwhelming use was equestrian (Table 5.1-47). Biking was the second or third most popular activity at all survey sites, with between nine percent (OWA) and 26 percent (LFC) identifying it as their primary trail use. Aside from the Diversion Pool (65 percent) and Lake Oroville (15 percent), equestrian use was the primary trail use of less than 10 percent of respondents at all sites. A nominal percentage of respondents at each site (between zero and nine percent) identified other uses (e.g., running, dog walking, handicapped) or multiple uses (a combination of two or more of the use types) as their primary use.

Table 5.1-47. Lake Oroville area visitors' primary type of trail use.

Trail Use Type	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Bike	11.3	20.4	25.5	18.4	16.1	9.1
Hike/walk	**69.9**	14.8	**68.1**	**74.4**	**65.3**	**81.8**
Equestrian	15.2	**64.8**	5.3	0.8	8.9	3.0
Other	1.8	0	1.1	4.0	8.9	6.1
Multiple types	1.8	0	0	2.4	0.8	0

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

The majority of trail use section respondents (between 64 and 83 percent) had used the trails in the study area before (Table 5.1-48). The highest percentage of first-time trail users were at Lake Oroville (36 percent) and the Forebay (32 percent). In addition, about one-quarter of respondents from the OWA were first-time trail users. At the Diversion Pool, LFC, and Afterbay, only about 18 percent of respondents were first-time trail users.

Table 5.1-48. First-time trail users at the Lake Oroville area.

	Resource Area					
	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
Is this your first time using trails in the area?						
Yes	36.4	17.9	17.5	32.3	18.3	25.7
No	**63.6**	**82.1**	**82.5**	**67.7**	**81.7**	**74.3**

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.6.2 Perceptions of Trail Crowding

Trail users were asked to rate their perception of crowding on the trails on a nine-point scale from "not at all crowded" (1) to "extremely crowded" (9). Most trail users did not feel crowded (Table 5.1-49). At least 50 percent of respondents at each resource area,

except the OWA, felt that the trail or trails they used during their trip to the study area was “not at all crowded”, and between 84 and 96 percent of respondents at those areas rated crowding as “slightly crowded” or lower on the scale. Mean crowding ratings at these areas were between about 1.5 and 2.1.

Perceptions of crowding were somewhat higher, if generally not high, at the OWA. Although 69 percent of respondents rated the trails as “slightly crowded” or lower on the scale, about 23 percent gave a moderate crowding rating (between 4 and 6), and about 8 percent rated crowding in the top third of the scale. The OWA mean trail crowding rating of 3.1 was also the highest of any of the resource areas.

Table 5.1-49. Lake Oroville area trail users’ perceptions of trail crowding.

	Resource Area					
Crowding Rating	Lake Oroville (%)	Diversion Pool (%)	LFC (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)	OWA (%)
1 – Not at all crowded	**63.3**	**74.5**	**61.3**	**53.4**	**61.2**	**38.5**
2	15.7	12.7	14.0	16.5	7.5	13.5
3 – Slightly crowded	9.6	9.1	11.8	16.5	14.9	16.7
4	4.3	0.0	4.3	4.5	6.0	3.1
5	3.9	3.6	4.3	2.3	3.0	7.3
6 – Moderately crowded	2.2	0.0	3.2	4.5	3.0	12.5
7	0.2	0.0	0.0	0.8	3.0	1.0
8	0.0	0.0	0.0	0.0	0.0	1.0
9 – Extremely crowded	0.8	0.0	1.1	1.5	1.5	6.3
Mean Rating	1.8	1.5	1.9	2.1	2.1	3.1

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

The Brad P. Freeman trail route through the OWA follows gravel levee-top roads and is lightly used; therefore, these crowding responses most likely relate to unofficial river access trails.

5.1.6.3 Trail Users’ Perceptions of Encounters on Trails

Trail users were asked whether, during the current trip, they had any encounters on the trail with other users that they felt put them at risk and, if so, to describe the encounter. Relatively few respondents – 30 of 525 at Lake Oroville (6 percent) and less than 12 at any of the resource areas (about 1 to 8 percent) – reported having had such an encounter (Table 5.1-50). Sites with the greatest percentage of respondents reporting such an encounter were the Diversion Pool (9 percent), Forebay (8 percent), and the LFC (7 percent). Across all six resource areas, 59 of 991 respondents (6 percent) indicated that they had an encounter that put them at risk.

In addition to the written descriptions discussed below, trail users were asked to indicate (circle) the type or types of trail users (bicyclists, equestrians, hikers/walkers, other) with

whom they had had "at risk" encounters during their trip (lower portion of Table 5.1-50). Nineteen of the 59 who said they had an encounter (32 percent) provided no response. Among those who did respond, no one type of trail user was prominent as having been involved in a majority of the encounters, and encounters with "other" types (e.g., disc golfers, runners, cars, ATVs) were most common in four of the areas. There were, however, notable patterns at some areas. At Lake Oroville, "at risk" encounters with bicyclists and hikers/walkers were equally common (each was circled by 8 of the 30 trail users who had these types of encounters). At the Diversion Pool, encounters with bicyclists were most common (circled by 3 of the 5 respondents who had "at risk" encounters).

Table 5.1-50. Occurrence and types of at-risk encounters on trails in the Lake Oroville area.

	Resource Area					
	Lake Oroville (%)	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
On this trip, did you have any encounters on the trail with other users that put you at risk?						
Yes	5.7	8.8	6.9	7.9	1.4	5.2
No	**94.3**	**91.2**	**93.1**	**92.1**	**98.6**	**94.8**
If yes…With whom have you had these encounters? (circle all that apply) [1]						
Bicyclists	**26.7**	**60.0**	14.3	0.0	0.0	0.0
Equestrians	16.7	40.0	0.0	18.2	0.0	0.0
Hikers/Walkers	**26.7**	40.0	14.3	9.1	0.0	20.0
Other	20.0	40.0	**28.6**	**27.3**	**100.0**	**40.0**
Unknown (no resp.)	30.0	0.0	42.9	45.5	0.0	40.0

1. Percentages are based on those who answered "yes" to the first part of the question (respondent did have an encounter that put them at risk).
Note: "Other" encounters were primarily with animals (deer, turkey, snakes) and motorized users. ***Bold*** *type indicates the most frequent response for each area.*
Source: On-Site Survey.

Turning to the written descriptions of encounters, which is discussed later for the study area as a whole, these generally paralleled the responses above. Thirteen of the 59 (22 percent) did not provide a description of the encounter, and 16 of the 59 (27 percent) described something other than an encounter with another trail user, or even another visitor, such as encounters with rattlesnakes and other animals on the trail, or undesirable physical trail conditions, such as glass or rocks on the trail. Another 15 (25 percent) described encounters with non-trail users, such as people shooting guns nearby, people loitering near the trail or trailhead whom they considered threatening or who harassed them, or people causing vandalism to vehicles at a trailhead.

The remaining 15 of the 59 respondents who had indicated they had an "at risk" encounter (25 percent) described three types of encounters. Ten trail users (nine of whom were equestrians) described encounters with bike riders during which the bicyclists did not follow trail etiquette (e.g., by not giving right-of-way to horseback riders or coming up on horseback riders unexpectedly or too fast). Six of the ten encounters

with bikes were described by Lake Oroville respondents, three were described by Diversion Pool respondents, and one was described by an LFC respondent. Three trail users (two at Lake Oroville and one at the LFC) described encounters with people walking or running with dogs. Finally, one equestrian trail rider surveyed at the Saddle Dam trailhead on Lake Oroville encountered bike riders participating in the "Poker Run" event of which he was unaware and one trail walker encountered a motorized scooter on the paved trail at Riverbend Park.

5.1.6.4 Satisfaction with Condition of Trails

Trail users were asked if, overall, they were satisfied with the condition of Lake Oroville area trails on their trip. Overall satisfaction with the condition of trails was high at all survey sites (Table 5.1-51). Five resource areas had more than 90 percent of respondents indicating satisfaction (Lake Oroville, Diversion Pool, LFC, Forebay, and Afterbay), and the level of satisfaction was near 90 percent at the OWA. Most of the OWA respondents were referring to unofficial trails providing access from levee roads to the Feather River.

Table 5.1-51. Satisfaction with the condition of Lake Oroville area trails.

	Resource Area					
	Lake Oroville (%)	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
Overall, are you satisfied with the condition of Lake Oroville Area trails on this trip?						
Yes	**90.8**	**91.1**	**94.4**	**91.8**	**90.5**	**87.2**
No	9.8	8.9	5.6	9.7	12.8	23.3

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

The reasons trail users gave for not being satisfied with the condition of trails indicate that they interpreted "trail condition" broadly, understanding it to encompass more than just the condition of the trail surface. The most frequent reasons for dissatisfaction varied across resource areas (Table 5.1-52). At Lake Oroville, the most frequent reason for dissatisfaction was the reservoir level being too low (21 percent), making access to the water from trails difficult (this is more a matter of trail routing and reservoir drawdown rather than trail condition). Other more common reasons given at Lake Oroville were perceived maintenance needs on the trails (12 percent) and lack of signage (10 percent).

At the Diversion Pool, 40 percent of respondents identified maintenance needs on the trails as the primary reason for dissatisfaction, while a few others mentioned dust from the trail maintenance machine (20 percent). Two other types of responses were unrelated to trail condition (problems with other users, and a need for more facilities). It should be noted that these responses are from a total of five trail users at the Diversion Pool who were dissatisfied with trail conditions.

Reasons for dissatisfaction at the LFC, Forebay, and Afterbay were similar to the reasons given at the Diversion Pool, with some perceived need for more trail maintenance but equal or greater numbers of trail users commenting on a desire for more trails or facilities. (Similar to the Diversion Pool, the total number of trail users dissatisfied with trail conditions at each of these sites was very low, between 5 and 10 respondents). Most of the 10 OWA trail users who were dissatisfied with conditions mentioned litter problems (primarily along the river) and rocky trails. (The unofficial trails used by anglers to reach the river from levee-top roads tend to be steep and rocky, and may be difficult for anglers to use, particularly in wet shoes or waders.)

Table 5.1-52. Reasons for dissatisfaction with condition of trails.

Reason	Resource Area					
	Lake Oroville (%)	**Diversion Pool (%)**	**LFC (%)**	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**	**OWA (%)**
Lake level too low/poor access to water	**21.4**	0.0	**20.0**	0.0	**16.7**	9.1
Trails need maintenance (removal of poison oak, weeds, rocks; erosion)	11.9	**40.0**	**20.0**	**20.0**	**16.7**	27.3
Lack of signage	9.5	0.0	0.0	10.0	**16.7**	
Need water on trails	9.5	0.0	0.0	10.0	**16.7**	
Want more trails and associated facilities	7.1	20.0	**20.0**	**20.0**	0.0	18.2
Better accessibility needed (handicapped access, OHV access)	4.8	0.0	0.0	0.0	**16.7**	0.0
Problems with other users/want separate bike/horse trails	4.8	20.0	0.0	**20.0**	0.0	0.0
Dust/mud from use of trail machine (grader)	2.4	20.0	0.0	0.0	0.0	0.0
Litter problems	0.0	0.0	**20.0**	10.0	0.0	**36.4**
Other	9.5	0.0	0.0	0.0	0.0	0.0
No reason given	19.0	0.0	20.0	10.0	16.7	9.1

Note: Responses are from only those respondents who completed the trails section of the survey and answered that they were not satisfied with the condition of the trails. Some respondents gave more than one reason for their dissatisfaction. The response format for this question was open-ended. ***Bold*** *type indicates the most frequent reason(s) for dissatisfaction for each area.*
Source: On-Site Survey.

5.1.6.5 Favorite Trails

Trail users were asked to name their favorite trail or trail section in the Lake Oroville area. Only about 30 percent of trail users provided a response, and only about 13 percent listed a specific trail. The most frequently mentioned trail was the Feather Falls trail, which is in the Plumas National Forest and outside of the study area.

Three of the major developed trails within the study area (the Brad P. Freeman, Dan Beebe, and Roy Rogers trails) were mentioned by 12 to 20 trail users. Sixteen people listed the top of Oroville Dam (commonly used by walkers and joggers) as their favorite trail. Most others listed a general area such as the Afterbay or Loafer Creek and did not give specific trail names or sections of trails.

5.1.7 Boating Sub-section of the On-site Survey

Respondents who had boated or expected to boat on the Feather River or a study area reservoir during their trip were asked to respond to the boating sub-section of the On-Site Survey. A total of 1,361 of the 2,583 On-Site Survey respondents (53 percent) completed the boating section.

Boaters were asked about the following topics: the site at which they primarily boated during their trip; experiences with other users on the water that put them at risk or observations of boating activity that put others at risk; perceptions of crowding on the water; primary type of watercraft used at the Lake Oroville area, whether they rented or owned the watercraft, and whether it was docked or moored at Lake Oroville; use of boat launches in the Lake Oroville area; waits to launch at boat ramps; and overall satisfaction with their boating experience during their current trip to the Lake Oroville area.

Data from only three of the six resource areas – Lake Oroville, the Forebay, and Afterbay – are included here. Very few survey respondents contacted at the Diversion Pool, LFC, or OWA were boaters; therefore, few completed the boating section of the survey, and the sample sizes for those resource areas and questions are too small to provide useful data (often 10 or fewer respondents).

5.1.7.1 Primary Areas Where Boated During Visit

Most boaters were interviewed at the location of primary boating activities during their current trip to the Lake Oroville area (Table 5.1-53). About 98 percent of boaters surveyed at Lake Oroville primarily boated on one of the six zones of Lake Oroville. The greatest proportion of these indicated that they primarily boated on the Main Basin, and most others primarily boated on the popular Middle and South Fork arms, both adjacent to the Main Basin at the southern end of the reservoir. Study R-7 *Reservoir Boating* provides more detailed information, based on numerous field observations, about boating use distribution on Lake Oroville. Given that the Main Basin is not the most heavily used portion of the reservoir (see Study Report R-7 *Reservoir Boating*), it may be that some boaters did not refer to the reservoir zone map in the survey booklet and understood the Main Basin to include a larger portion of the reservoir than intended.

At the Forebay, the largest percentage of boaters (47 percent) had primarily boated at the Forebay, as would be expected, but 20 percent had primarily boated on the Main Basin of Lake Oroville, and over 36 percent had primarily boated on some portion of Lake Oroville. This suggest that many Forebay visitors divide their visit between the larger reservoir and the Forebay, perhaps due to the sand beach and large picnic area provided at the North Forebay DUA. The similar facility at the Loafer Creek DUA on Lake Oroville was severely affected by low water conditions during most of the survey period.

Table 5.1-53. Primary site where boated.

Site	Resource Area		
	Lake Oroville (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)
Lake Oroville			
Main Basin	**41.8**	20.0	6.0
Lower North Fork	6.0	5.5	0.0
West Branch	12.1	1.8	0.5
Upper North Fork	7.8	1.8	1.0
Middle Fork	12.5	5.5	0.5
South Fork	17.6	1.8	0.5
Downstream Areas			
Diversion Pool	0.0	1.8	0.5
Forebay	0.3	**47.3**	3.0
Afterbay	0.4	7.3	**72.6**
OWA	0.5	5.5	11.4
Feather River	1.0	1.8	4.0

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

In contrast, about 73 percent of boaters surveyed at the Afterbay had primarily boated at the Afterbay, and most of the remainder boated at other downstream reservoirs and on the Feather River rather than at Lake Oroville.

5.1.7.2 Encounters with Other Boaters

Boaters were asked if, during their trip, they had personally experienced any encounter with other users on the water that they felt put them at risk. If so, they were asked to describe the encounter and indicate the general area where it occurred. The vast majority of boaters – 87 to 97 percent in each of the resource areas – did not experience encounters with others on the water in which they felt they had been put at risk (Table 5.1-54). The 13 percent of respondents at the Afterbay who reported experiences in which they felt they were put at risk was nearly twice the percentage as at Lake Oroville. Specific occurrences that caused respondents to feel at risk included other boats coming too close to the respondents' boat, PWC users operating unsafely,

boaters speeding, especially in 5 mph zones, boaters not following boating safety rules, boaters drinking alcohol, and people swimming near docks or boat ramps.

Table 5.1-54. On-water encounters that boaters felt put them at risk.

	Resource Area		
	Lake Oroville (%)	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**
Did you have an encounter that put you at risk?			
Yes	6.8	2.8[1]	12.8
No	**93.2**	**97.2**	**87.2**
Description of the encounter(s)[2]			
Boats coming too close	**25.0**	0.0	17.4
PWC users unsafe/reckless	17.9	**50.0**	**39.1**
Boaters speeding	12.5	0.0	0.0
Boaters not following boating safety rules in general	**25.0**	0.0	17.4
Alcohol use by boaters	5.4	0.0	4.3
Swimming at launch/docks	1.8	0.0	0.0
Other	1.8	**50.0**	4.3
No description given	10.7	0.0	17.4

1. The 2.8 percent of Forebay boaters who had an encounter that put them at risk represents just 2 boaters; 72 of the 92 boaters surveyed at the Forebay answered the question.
2. Percentages are based on those who answered "yes" to the question (had an encounter that put at risk).
*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

The top two encounter situations at Lake Oroville were boats coming too close to skiers, other stationary or moving boats, and other instances of boaters not following boating safety rules such as improper passing, skiing in no-ski zones, stopping in high traffic areas, turning suddenly, etc. About 18 percent of the encounters described specifically described PWC users putting them at risk by behaving unsafely. These encounters occurred at many different areas of Lake Oroville, but the busiest areas (the Main Basin, South Fork, and Middle Fork zones), accounted for most of the locations described (Table 5.1-55). The Bidwell Canyon portion of the Main Basin, where the Bidwell Marina and Boat Ramp and Loafer Creek Boat Ramp are located, accounted for about 15 percent of the locations mentioned.

Only two boaters at the Forebay had this type of encounter on the water, one related to PWC use and the other related to conflict with anglers. However, neither incident occurred on the Forebay. At the Afterbay, unsafe behavior by PWC users accounted for nearly 40 percent of unsafe encounters. PWC use is particularly popular near several of the boat ramps on the Afterbay. The remaining encounters were, for the most part, similar to the incidents of boaters coming too close and other general unsafe boating behavior described by Lake Oroville boaters. As expected, most of the incidents occurred on the Afterbay; in some cases more specifically near the Larkin Road Car-top Boat Ramp or other launch areas.

Table 5.1-55. Location of encounter that put boaters at risk.

Location	Resource Area		
	Lake Oroville (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)
Lake Oroville			
Main Basin	11.8	0.0	11.1
Bidwell Canyon	14.7	0.0	0.0
Foreman Creek Car-top BR	2.9	0.0	0.0
Canyon Creek	2.9	0.0	0.0
South Fork	**17.6**	0.0	0.0
Enterprise BR	2.9	0.0	0.0
Middle Fork	14.7	0.0	0.0
West Branch	8.8	0.0	5.6
Lower North Fork	11.8	**50.0**	0.0
Upper North Fork	5.9	0.0	0.0
Downstream Areas			
Thermalito Afterbay	0.0	0.0	**66.7**
Larkin Road Car-top BR	0.0	0.0	5.6
Low Flow Channel	0.0	**50.0**	0.0
Launch ramps	5.9	0.0	5.6

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.7.3 Observations of Boating Activity that Put Others at Risk

In addition to the question discussed above about encounters that put themselves at risk, boaters were asked if they had observed any boating activity that put others at risk. If so, respondents were asked to describe the unsafe activity. The vast majority of boaters at Lake Oroville, Thermalito Forebay, and Thermalito Afterbay did not observe boating activity that they felt put others at risk. As with the previous question discussed above, there were very few respondents (a total of four, all at the Thermalito Forebay) that observed unsafe activity.

The same types of descriptions used to describe encounters in Table 5.1-54 were used to describe boating activities that put others at risk in Table 5.1-56. Generally, the most common activities that put others at risk were PWCs operating unsafely, speeding, and other boaters not following boating safety rules. Unsafe behavior by PWC users is, once again, most notable at the Afterbay where it comprised nearly half of the unsafe behaviors described by boaters.

Table 5.1-56. Observations of boating activity that put others at risk.

	Resource Area		
	Lake Oroville (%)	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**
Did you observe any boating activity today that put others at risk?			
Yes	12.8	5.7[1]	12.3
No	**87.2**	**94.3**	**87.7**
Description of activity observed[2]			
Boaters coming too close to others	12.6	0.0	5.3
PWC users unsafe/reckless	18.9	**75.0**	**47.4**
Boaters speeding	20.0	0.0	15.8
Boaters not following boating safety rules in general	**28.4**	0.0	21.1
Alcohol use by boaters	5.3	25.0	10.5
Swimming at launch/docks	5.3	0.0	0.0
Other	9.5	0.0	0.0

1. The 5.7 percent of Forebay boaters who observed boating activity that put others at risk represents just 4 boaters of the 70 boaters surveyed there who answered the question.
2. Percentages are based on those who answered "yes" to the first part of the question (respondent did observe activity that put others at risk).
***Bold** type indicates the most frequent response/response category for each area.*
Source: On-Site Survey.

5.1.7.4 Perceptions of Crowding on the Water

The majority of boaters at Lake Oroville (65 percent), the Forebay (77 percent), and the Afterbay (67 percent) stated that the water on which they had spent time that day was "not at all crowded" to "slightly crowded" (Table 5.1-57). Boaters surveyed in all three resource areas provided an average crowding rating of about 3, meaning the average perception was that the reservoirs were "slightly crowded." While 14 percent of respondents at the Afterbay and 13 percent of respondents at Lake Oroville felt that the water was "moderately crowded," only 7 to 9 percent of respondents at each area felt that it was more than "moderately crowded" on the water (7 to 9 on the scale).

Table 5.1-57. Boaters' perceptions of crowding on the water.

Crowding Rating	Resource Area		
	Lake Oroville (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)
1 – Not at all crowded	**34.6**	**41.6**	**36.7**
2	14.5	15.6	18.8
3 – Slightly crowded	16.3	19.5	11.8
4	6.1	5.2	7.0
5	8.5	1.3	4.4
6 – Moderately crowded	12.8	7.8	13.5
7	3.7	0	3.5
8	1.6	2.6	2.2
9 – Extremely crowded	1.8	6.5	2.2
Mean Rating	3.1	2.8	2.8

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.7.5 Watercraft Types Used by Lake Oroville Area Boaters

Boaters were asked to indicate the type of watercraft they primarily use when visiting the Lake Oroville area. Runabouts, ski boats, pontoons, and cabin cruisers (treated as one category on the survey) were the dominant types of watercraft at all three resource areas, particularly at Lake Oroville where 73 percent of respondents identified them as the watercraft they primarily used (Table 5.1-58). The next most frequent primary boat type at Lake Oroville was houseboats at 11 percent. Pontoon boats and cabin cruisers tend to be moored at marinas rather than launched at ramps and are therefore uncommon or absent on the Forebay and Afterbay.

Table 5.1-58. Type of watercraft used at the Lake Oroville area.

Watercraft Type	Resource Area		
	Lake Oroville (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)
Runabout/Ski boat/Pontoon/Cabin cruiser	**72.8**	**43.7**	**57.8**
Houseboat	11.0	4.6	2.2
Sailboat	1.4	11.5	0.4
Canoe/Kayak	1.3	18.4	2.6
PWC	7.7	6.9	28.0
Other types (fishing boat, bass boat, drift boat, etc.)	5.8	14.9	9.1

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

A substantially larger portion of boaters surveyed at the Forebay as compared to the other reservoirs were non-motorized boaters such as sailboaters, canoers, and kayakers, who together comprised about 30 percent of Forebay boaters. Other boat

types (in particular, fishing boats) were also fairly common. Boat types used by Afterbay boaters were mainly of two types - the aforementioned runabouts/ski boats (few larger pontoon or cabin cruisers are launched there) and PWC (28 percent), whose users favor the sandy shoreline available at the two Afterbay launch areas.

5.1.7.6 Ownership and Moorage of Boats used on the Lake Oroville Area

Boaters were asked if they owned or rented the boat they primarily used and if they docked or moored it (i.e., at a marina) at Lake Oroville. The overwhelming majority of boaters owned their watercraft, particularly at Lake Oroville and the Afterbay, where ownership rates were near 90 percent (Table 5.1-59). The highest rate of rented watercraft was at the Forebay (16 percent), which also had the highest rate of respondents indicating "other." Boaters who circled "other" were asked to explain; these responses typically meant that the boater borrowed the boat from a family member or friend, or they used it with the family member or friend that owned it.

Table 5.1-59. Ownership of primary watercraft used.

Response	Resource Area		
	Lake Oroville (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)
Own	**88.8**	**71.6**	**89.2**
Rent	4.6	16.0	1.6
Other [1]	6.6	12.3	9.2

1. Other most often meant that the respondent borrowed from or used a boat with friend or family member owner.
*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

No more than 20 percent of boaters surveyed at any of the resource areas indicated that they dock or moor their watercraft at Lake Oroville (Table 5.1-60). This means that between 80 and 92 percent of respondents transported their primary watercraft to the Lake Oroville area for each boating trip. Boating data collected for Study R-7 – *Reservoir Boating* indicate that Lake Oroville boaters whose boat is moored at one of the two marinas (primarily houseboaters and sailboaters) comprise more than 20 percent of boaters. However, because most surveys of boaters occurred at boat ramps, marina boaters are somewhat under-represented in the survey sample. At the same time, it is likely that lower percentages of boaters than indicated by the responses to this question actually kept their boat at one of the marinas. This is because some boaters appear to have understood "dock or moor your boat" to include temporary use of boarding docks at boat ramps.

Boaters who docked or moored their primary watercraft at Lake Oroville were also asked to indicate if they did so seasonally or year-round. However, the response rate to this portion of the question was very low; thus, the data are not reported.

Table 5.1-60. Moorage of primary watercraft used at Lake Oroville.

Response	Resource Area		
	Lake Oroville (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)
For the watercraft you primarily use, do you dock or moor it at Lake Oroville?			
Yes	19.5	8.4	11.8
No	**80.5**	**91.6**	**88.2**

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.7.7 Use of Lake Oroville Area Boat Ramps

Boaters were asked if they had ever used one of the boat ramps in the Lake Oroville area and, if so, which ones they had used during the last 12 months, and which ramp they used most frequently. From 85 to 93 percent of boaters at each of the three resource areas had used one of the boat ramps (Table 5.1-61). This result corresponds with the high percentage of surveyed boaters who were ramp users rather than marina boaters and the high percentage who were repeat visitors.

Table 5.1-61. Past use of the boat ramps in the Lake Oroville area.

Response	Resource Area		
	Lake Oroville (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)
Yes	**93.3**	**84.6**	**88.0**
No	6.7	15.4	12.0

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

When asked which of the boat ramps they had used in the past 12 months, most boaters identified multiple ramps (Table 5.1-62). Most popular with respondents surveyed at Lake Oroville were the four main developed ramps: Bidwell Canyon (54 percent), Spillway (43 percent), Lime Saddle (40 percent), and the Loafer Creek ramp (27 percent). The other ramps at Lake Oroville and at the downstream locations had been used by five percent or less of the boaters surveyed at Lake Oroville.

It is interesting to note that among boaters surveyed at the Forebay, the four major developed ramps at Lake Oroville were used by more boaters during the last 12 months than either of the two Forebay ramps. From 31 to 39 percent of boaters had used those Lake Oroville ramps, as compared to 22 percent who had used the Forebay ramps. This suggests that Lake Oroville is the primary boating area for many boaters who also use the Forebay. Among Afterbay boaters, the main developed Afterbay boat ramp,

Monument Hill, was the boat ramp used by the largest percentage of respondents (55 percent), and about 32 percent used the Afterbay car-top ramp at Larkin Road. Similar to the Forebay boaters, however, 30-40 percent had also used three of the major developed ramps at Lake Oroville, indicating that most Afterbay boaters also boat on Lake Oroville.

Table 5.1-62. Lake Oroville area boat ramps boaters had used during the last 12 months.

Boat Ramp	Resource Area		
	Lake Oroville (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)
Lake Oroville Ramps			
Lime Saddle	39.5	31.2	40.8
Spillway	42.5	35.1	31.0
Bidwell Canyon	**54.0**	**39.0**	30.5
Loafer Creek	27.1	35.1	17.8
Enterprise	4.9	6.5	2.3
Dark Canyon Car-top ramp	1.4	6.5	1.7
Stringtown Car-top ramp	3.9	9.1	2.9
Nelson Bar Car-top ramp	1.2	7.8	1.7
Vinton Gulch Car-top ramp	0.6	5.2	0.6
Foreman Creek Car-top ramp	4.1	11.7	2.9
Forebay Ramps			
N. Thermalito Forebay	3.4	22.1	14.4
S. Thermalito Forebay	3.2	22.1	16.1
Afterbay Ramps			
Monument Hill	5.4	13.0	**54.6**
Larkin Road Car-top ramp	3.6	10.4	31.6
Other Ramps			
Div. Pool-Burma Rd/RR Grade	0.1	7.8	2.3
River launches (undeveloped)	1.0	9.1	4.6
Other (Wilbur Road, OWA ponds)	0.3	2.7	3.5

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

In general, the clusters of boat ramps identified by boaters surveyed in each resource area as the one they use most frequently are similar to the ramps used in the past 12 months, though the ramps with the highest percentage of use changed slightly (Table 5.1-63). At Lake Oroville, the Lime Saddle ramp was used most frequently by 29 percent of respondents, followed by Bidwell Canyon (27 percent) and Spillway (23 percent). Loafer Creek was used most often by 13 percent of boaters, while all others were mentioned by three percent or fewer.

At the Forebay, Loafer Creek was the launch used most frequently by individual boaters (16 percent), followed closely by Bidwell Canyon and the North Thermalito Forebay (15

percent each), then the Spillway boat ramp (12 percent). Once again, these responses suggest that many Forebay boaters also boat as frequently on Lake Oroville.

Table 5.1-63. Lake Oroville area boat ramps boaters use most frequently.

Boat Ramp	Resource Area		
	Lake Oroville (%)	Thermalito Forebay (%)	Thermalito Afterbay (%)
Lake Oroville Ramps			
Lime Saddle	**28.6**	8.7	11.9
Spillway	23.0	11.6	12.4
Bidwell Canyon	27.0	14.5	7.3
Loafer Creek	12.9	**15.9**	2.6
Enterprise	3.1	0.0	0.0
Dark Canyon Car-top ramp	0.2	1.4	0.5
Stringtown Car-top ramp	1.2	1.4	0.5
Nelson Bar Car-top ramp	0.1	0.0	1.0
Vinton Gulch Car-top ramp	0.0	0.0	0.0
Foreman Creek Car-top ramp	2.1	4.3	0.5
Forebay Ramps			
N. Thermalito Forebay	0.2	14.5	2.6
S. Thermalito Forebay	0.2	10.1	3.6
Afterbay Ramps			
Monument Hill	0.5	1.4	**30.1**
Larkin Road Car-top ramp	0.2	2.9	17.6
Other Ramps			
Div. Pool-Burma Rd/RR Grade	0.1	4.3	0.0
River launches (undeveloped)	0.1	4.3	4.1
Other (Wilbur Road, OWA ponds)	0.2	4.3	5.2

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

Respondents at the Afterbay identified the Monument Hill ramp as the one they most frequently used (30 percent), followed by Larkin Road (18 percent). The Spillway and Lime Saddle ramps at Lake Oroville were each used most frequently by about 12 percent of boaters surveyed at the Afterbay, followed by Bidwell Canyon, with seven percent of responses. These responses suggest that Afterbay boaters, unlike Forebay boaters, tend to focus their boating activity in that area rather than on Lake Oroville.

5.1.7.8 Waits to Use Boat Ramps in the Lake Oroville Area

Boaters who had used one of the study area boat ramps were asked if they typically had to wait to use the launch they most frequently use and, if so, the average number of minutes they have to wait. Most boaters said they typically do not have to wait to launch (Table 5.1-64). Lake Oroville had the most respondents that typically have to wait to launch with 45 percent, as compared to 39 percent of Thermalito Afterbay boaters and 25 percent of Thermalito Forebay boaters. Of those boaters who have to

wait to launch, generally most waited 10 minutes or less, and waits of five minutes or less were most common among Afterbay boaters. About 75 to 77 percent of Lake Oroville and Thermalito Afterbay respondents waited 10 minutes or less to launch on average, while about 61 percent of Thermalito Forebay respondents waited 10 minutes or less. Typical waits longer than 15 minutes were mentioned by relatively few Lake Oroville or Afterbay boaters. However, 33 percent of Forebay boaters said they waited between 16 and 20 minutes to launch on average. (As the Forebay ramps do not receive heavy use, the six of 18 Forebay boaters who listed wait times of 20 minutes may have been referring to conditions during sailing events held at the Forebay.)

Table 5.1-64. Waits to use boat ramps in the Lake Oroville area.

	Resource Area		
	Lake Oroville (%)	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**
Do you typically have to wait to use the boat launch you most frequently use?			
Yes	45.3	25.0	38.5
No	**54.7**	**75.0**	**61.5**
On average, how many minutes do you have to wait to use this ramp?			
1-5 min.	36.5	16.7	**48.3**
6-10 min.	**38.0**	**44.4**	28.6
11-15 min.	14.3	5.6	14.3
16-20 min.	7.3	33.3	5.4
21+ min.	3.9	0.0	3.6
Ave. wait (min.)	10.2	12.8	9.2

*Note: **Bold** type indicates the most frequent response for each area.*
Source: On-Site Survey.

5.1.7.9 Boaters' Satisfaction with their Boating Experience

Boaters' overall satisfaction with their boating experience on their current trip to the Lake Oroville area was very high (Table 5.1-65). Satisfaction was highest at the Forebay with 91 percent satisfied, but the satisfaction rate was very similar among Afterbay boaters (89 percent) and Lake Oroville boaters (88 percent).

Among the relatively few dissatisfied boaters at Lake Oroville, the highest percentage of those boaters (41 percent) mentioned low pool level as a reason for not being satisfied. The second most common reason for dissatisfaction was boat ramp or boat launching problems, mentioned by about 20 percent of those who were not satisfied. Boat ramp problems included congestion at the boat ramp or inexperience boaters trying to launch, or complaints about long walks to parking areas at Lime Saddle and Bidwell ramps. Most ramp problems were associated with low reservoir pool levels. About 10 percent mentioned facilities as a reason; most complained about a lack of sandy shoreline areas to beach the boat, swim, and picnic. Generally issues such as hazards in the water and

unfavorable conditions (choppy, windy) or marina problems were not major reasons for dissatisfaction.

Table 5.1-65. Boater satisfaction with their boating experience and reason for dissatisfaction.

	Resource Area		
	Lake Oroville (%)	**Thermalito Forebay (%)**	**Thermalito Afterbay (%)**
Overall, are you satisfied with your boating experience on this trip to the Lake Oroville area?			
Yes	**88.3**	**90.7**	**89.2**
No	11.7	9.3	10.8
If No…Why not?			
Lake level too low	**41.4**	14.3	**52.9**
Boat ramp/launching problems	20.2	**28.6**	11.8
Parking inadequate	6.1	14.3	0.0
Hazards in the water	2.0	0.0	5.9
Want more or better facilities	10.1	**28.6**	0.0
Unfavorable conditions	5.1	0.0	11.8
Too crowded on the water	7.1	0.0	11.8
Problems with marina/marina service	4.0	0.0	5.9
Other	5.1	0.0	5.9
Did not give a reason	12.1	14.3	11.8

Note: Boater could list more than one reason for not being satisfied. Responses are from only those respondents who completed the boating section of the survey and answered that they were not satisfied with their boating experience. The response format for this question was open-ended. ***Bold*** *type indicates the most frequent response for each area.*
Source: On-Site Survey.

The few boaters surveyed at the Forebay who were not satisfied (7 boaters) generally commented on boat ramps and other facilities, as well as low water, but the reasons given related to Lake Oroville, rather than the Forebay. Several of the 17 boaters surveyed at the Afterbay who were not satisfied also cited reasons related to low water levels and other issues at Lake Oroville, but several also said low water levels and difficulty launching at low water levels were also a reason for dissatisfaction on the Afterbay.

5.1.8 Additional Comments Provided by On-Site and Mailback Survey Respondents

Both the On-Site and Mailback Surveys provided opportunities at the end of each survey booklet for respondents to write any additional comments they might have related to the survey topics covered or other issues. About 48 percent (1,246 of 2,583) of the On-Site Survey respondents provided additional comments, and about 65 percent (696 of 1,071) of Mailback Survey respondents did so. Many of the comments were unspecific positive or negative statements about the Lake Oroville area or the

respondents' experience there, while others provided more specific positive feedback, complaints, or requests. Common categories of comments, such as those commenting on low reservoir pool levels and effects of low pool levels on boating facilities and other facilities and activities, are summarized and in select cases listed verbatim in other study reports, such as Study R-3 – *Assessment of the Relationship of Project Operations and Recreation*.

All of the comments given are listed verbatim in Appendix J.

5.2 HUNTER SURVEY RESULTS

The Hunter Survey was administered to hunters in the OWA during the fall and winter of 2002-03. The hunting season for the OWA generally runs from September through January, but varies by species hunted. The Hunter Survey effort included on-site and follow-up mailback components similar to those used for the general visitor On-Site Survey, but with several new hunting-specific questions added, and some items judged not relevant were deleted. Section 4.3 provides additional detail on the survey methodology used and the samples obtained.

This section summarizes the results of survey questions categorized into the following general groups: description of past use of area and current visit; evaluation of their hunting experience; use of and perceptions of hunting at the OWA; satisfaction with their hunting experience; comments on desired improvements; recreation setting preferences; perception of management, water condition, and user interaction; adequacy of the number of facilities; overall satisfaction; and additional comments. Demographic information from the Hunter Survey is provided in Appendix F.

5.2.1 Description of Hunters' Past Use of Area and Current Visit

Hunters were first asked to describe their current visit to the Lake Oroville area. Related to past use, hunters were asked how frequently they visited the Oroville area (including the OWA), and what seasons they had visited during the past 12 months. Regarding their current visit, they were asked about their time and date of arrival and departure, hunting sites they intended to visit, and the size of the group with which they were visiting the area.

5.2.1.1 Hunters' Frequency and Seasons of Use of Lake Oroville Area

Hunters were asked to describe their frequency of visits to the Lake Oroville area, in terms of whether or not they identified themselves as frequent, occasional, or infrequent visitors to the area. The majority of hunters (78 percent) considered themselves to be regular visitors, which was defined in the survey as visiting three or more times per year (Table 5.2-1). Nine percent of respondents considered themselves to be occasional

visitors (defined as visiting 1-2 times per year), and only one percent of visitors considered themselves to be infrequent visitors (visiting less than 1 time per year). Eleven percent of respondents were first time visitors.

Table 5.2-1. Hunters' frequency of visits to the Lake Oroville area.

Frequency of Visits	Percent
Regular visitor	78.4
Occasional visitor	9.3
Infrequent visitor	1.0
First visit	11.3

Source: Hunter Survey.

Since most hunting seasons are in the fall and winter, it is logical that more hunters visit the Lake Oroville area/OWA during the fall and winter, as confirmed by the 76 and 72 percent, respectively, who had visited during those seasons in the past 12 months (Table 5.2-2). However, the survey results show that just over half of the hunters also visited these areas during the spring and summer, suggesting they participate in other non-hunting activities in the study area.

Table 5.2-2. Seasonal use at the Lake Oroville area/Oroville Wildlife Area.

Season of visitation	Percent
Spring	51.0
Summer	52.0
Fall	76.0
Winter	72.0

Note: Respondents could mark more than one season.
Source: Hunter Survey.

5.2.1.2 Description of Hunters' Current Visit

Over 90 percent of hunters were visiting the area only for the day (Table 5.2-3). Only eight percent of respondents stayed for two days, and less than two percent stayed for three days. The few hunters surveyed who were staying more than one day (10 of the 106 surveyed) were either staying at a nearby private campground, with family, or in their own vehicle or RV onsite. A few others were planning to be on-site just for the day but were also camping or staying with family or friends as part of their trip.

Unlike other types of visitors, hunters tend to arrive on site very early, since early morning is a prime hunting period. Of respondents that stayed for one day, 42 percent arrived between 3:00 a.m. and 6:00 a.m., while 50 percent of respondents arrived

between 6:15 a.m. and 9:00 a.m. (Table 5.2-4). (Hunters arriving before dawn may have had to wait for gates to be opened at daybreak before they could drive into the area.) Very few one-day respondents (8 percent) arrived after 9:00 a.m. The visits also tended to be brief, with relatively few done hunting before 9:00 a.m. but about two-thirds having departed by noon (Table 5.2-4).

Table 5.2-3. Length of hunters' stay.

Length of stay	Percent
1 day	**90.4**
2 days	7.7
3 days	1.9

*Note: **Bold** type indicates the most frequent response.*
Source: Hunter Survey.

Table 5.2-4. Hunters' arrival and departure time (one-day visitors).

	Percent
Arrival Time	
3:00 a.m. to 6:00 a.m.	42.0
6:15 a.m. to 9:00 a.m.	**50.0**
After 9:00 a.m.	8.0
Departure Time	
6:30 a.m. to 9:00 a.m.	4.7
9:15 a.m. to 12:00 p.m.	**60.4**
After 12:00 p.m.	34.9

*Note: **Bold** type indicates the most frequent response.*
Source: Hunter Survey.

Most hunting in the study area occurs within the OWA, including the Afterbay subunit of the OWA. Therefore, it is appropriate that most hunters listed these sites as locations they planned on visiting. Approximately 60 percent of respondents planned on visiting the Afterbay and 56 percent of respondents planned on visiting the main area of the OWA (Table 5.2-5). Relatively few hunters planned to visit Lake Oroville or other downstream areas besides the OWA and Afterbay.

About 40 percent of the hunters hunted in groups of two, both of whom were generally adults (Table 5.2-6). Only 17 percent of respondents hunted alone. The other 43 percent of respondents hunted in groups of three (21 percent) or four or more people (22 percent). The average group size was 2.7, consisting of an average of 2.1 adults and 0.6 children. About 40 percent of the hunter groups included a child or children (usually 1 or 2 children).

Table 5.2-5. Study area locations hunters planned on visiting.

Location	Percent
Downstream Areas	
Thermalito Afterbay	60.4
OWA	56.6
Feather River (Diversion Pool to Hwy 162)	11.3
Clay Pit SVRA	10.4
Thermalito Forebay	5.7
Diversion Pool	4.7
Lake Oroville Areas	
Main Basin	12.3
Middle Fork	8.5
South Fork	8.5
Lower North Fork	5.7
Upper North Fork	5.7
West Branch	4.7

Note: Respondents could list more than one location.
Source: Hunter Survey.

Table 5.2-6. Respondent group size.

	Percent
Group Size	
1 person	17.1
2 people	40.0
3 people	21.0
4 or more people	22.0
Group Composition	
Mean number of adults	2.1
Mean number of children[1]	0.6
Mean total group size	2.7

1. About 40 percent of the hunter groups included one or more children.
Source: Hunter Survey.

5.2.2 Hunters' Evaluation of Their Hunting Experience at the OWA

Hunter respondents were asked a number of questions about their hunting experience and the OWA on the day the survey was administered. To that end, they were asked specific questions regarding the following: species they had been hunting that day; the number of animals they had taken from the OWA; perceptions of crowding at the OWA; encounters in the OWA they felt had placed them at risk and how they described such encounters; the portions of the Lake Oroville area where they hunt most often; adequacy of access to the OWA; reason(s) for choosing to hunt in the OWA or other Lake Oroville area sites; opinions of hunting regulations for Lake Oroville and the OWA; and satisfaction with their hunting experience.

5.2.2.1 Wildlife Species Hunted for and Taken in the OWA

Hunters were asked to indicate what species or type of wildlife they were hunting for that day, and the number of those types taken, if any (Table 5.2-7). Over half of respondents (56 percent) were hunting for ducks. Other popular hunted species included pheasant (39 percent), geese (25 percent), and quail (21 percent). Relatively few hunters were hunting for dove (9 percent), deer (5 percent), or turkey (8 percent). (The 8 turkey hunters surveyed were all participating in a special OWA spring turkey hunt after having their name drawn in a lottery. The hunt was limited to 15 hunters on each of 3 weekend hunting periods.)

Table 5.2-7. Species hunted for by hunters within the study area.

Species/Type of Wildlife	Hunting for Species (%) [1]	Took One or More (%)	Total no. of species taken
Ducks	55.7	50.8	96
Geese	24.5	11.5	4
Pheasant	38.7	43.9	29
Quail	20.8	27.3	16
Dove	9.4	0.0	0
Deer	4.7	0.0	0
Turkey	7.5	62.5	7

1. About 39 percent of hunters indicated they were hunting for more than one species, most often ducks and geese.
Source: Hunter Survey.

Hunters' success varied across species. About half of the duck hunters and about 44 percent of pheasant hunters took at least one bird. Quail and geese hunters experienced a lower level of success, with just over one-quarter of quail hunters taking a bird and only about 12 percent of goose hunters taking a goose. However, several of the quail hunters were also hunting for and took one or more pheasant. Similarly, several of the goose hunters were also hunting for and took one or more ducks.

Comparing across species hunted, duck hunters took the most birds, averaging about 1.6 birds among all duck hunters, and 3.2 birds among the 51 percent who took at least one duck (Table 5.2-8). Several duck hunters took six or more birds, and the maximum number taken was 10. Pheasant hunters were the second most successful group of hunters in terms of number of birds taken, with about 40 percent taking one or two birds, and a few hunters taking four birds. Although fewer quail hunters took a bird and most that were successful took just one or two birds, one hunter reported taking eight quail. Most pheasant hunters who were successful in taking a bird took just one, but several hunters reported taking two pheasant and two hunters took four each. Five of the eight

turkey hunters who completed the survey took one or two turkeys. None of the relatively few hunters hunting for dove or deer took an animal.

Table 5.2-8. Number of animals taken by OWA hunters, by species.

Species/ Type of Game	Number of animals taken [1]							Avg # taken (all)	Avg # taken (if >0)
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	>5 (%)		
Ducks	49.2	13.6	10.2	10.2	5.1	5.1	6.8	1.6	3.2
Geese	88.5	7.7	3.8	0.0	0.0	0.0	0.0	0.2	1.3
Pheasant	58.5	26.8	12.2	0.0	2.4	0.0	0.0	0.6	1.5
Quail	72.7	9.1	13.6	0.0	0.0	0.0	4.5	0.7	2.7
Dove	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Deer	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turkey	37.5	37.5	25.0	0.0	0.0	0.0	0.0	0.9	1.4

1. The percentages shown are based on the number of hunters who indicated they were hunting for each species (59 duck hunters, 26 goose hunters, 41 pheasant hunters, 22 quail hunters, 10 dove hunters, 5 deer hunters, and 8 turkey hunters).
Source: Hunter Survey.

5.2.2.2 Hunters' Perception of Crowding While Hunting

Hunters were asked to indicate how crowded they felt while hunting, using a 9-point scale where 1 meant "not at all crowded" and 9 meant "extremely crowded." The responses indicate that most hunters did not feel very crowded while hunting. The most frequent response was "not at all crowded" (27 percent), and more than 54 percent rated crowding as 3 ("slightly crowded") or lower on the scale (Table 5.2-9). However, about 30 percent rated crowding in the middle of the scale (from 4 to 6 – "moderately crowded") and about 16 percent gave crowding rating above 6. The mean crowding score of 3.8 corresponds to a rating of just above "slightly crowded."

Table 5.2-9. Hunters' perception of crowding while hunting at the OWA.

Crowding Rating	Percent
1 – Not at all crowded	27.2
2	13.6
3 – Slightly crowded	13.6
4	3.9
5	11.7
6 – Moderately crowded	14.6
7	6.8
8	1.9
9 – Extremely crowded	6.8
Mean Crowding Score	3.8

Source: Hunter Survey.

5.2.2.3 Encounters with Others that Hunters Felt put them at Risk

Hunters were asked if they had any encounters with others during their outing that they felt put them at risk and, if so, to describe the encounter. The vast majority of hunters (94 percent) said they did not have such an encounter (Table 5.2-10). Of the six respondents who did have an encounter they felt put them at risk, four said this encounter occurred because hunters were hunting too close together.

Table 5.2-10. Encounters with others that OWA hunters felt put them at risk.

Response	Percent
On this trip, did you have any encounters with other users that put you at risk?	
Yes	6.0
No	94.0
Description of Encounters (n=6)	
Hunters too close together	66.7
Fisherman too close to decoy	16.7
Unsafe hunters	16.7

Source: Hunter Survey.

5.2.3 Hunters' Use of and Perceptions of Hunting at OWA

The on-site portion of the Hunter Survey asked hunters about several aspects of their use of the OWA or other areas where they hunt in the study area. Specific survey

topics included areas where hunters hunt most often, adequacy of access, reasons for choosing to hunt in the area, and hunting regulations.

5.2.3.1 Areas of OWA Hunters Use Most Often and Perceptions of OWA Access

Approximately half of the hunters surveyed hunt most often in the Afterbay area and approximately half hunt most often in the OWA proper (Table 5.2-11). Of the three sub-areas of the OWA, 19 percent of respondents hunt in the south OWA area on the east side of the Feather River, about 16 percent hunt in the north OWA area, and about 15 percent of respondents hunt in the south OWA area on the west side of the Feather River most often. Hunters could list other areas where they hunted most often, besides the four areas listed on the survey, but none did so.

Over 83 percent of hunters felt that access to the OWA was adequate, as compared to about 17 percent who felt access is not adequate (Table 5.2-12). A subsequent section of this report discusses hunters' request for improvements at the OWA, one category of which related to access.

Table 5.2-11. Lake Oroville area where OWA hunters go most often to hunt.

Area	Percent
Thermalito Afterbay subunit of OWA	50.6
North OWA (area south of Hwy 162/Oroville Dam Boulevard but north of Afterbay outlet)	15.7
South OWA – west of the Feather River (area south of the Afterbay outlet)	14.6
South OWA – east of the Feather River (area west of Pacific Heights Road)	19.1

Source: Hunter Survey.

Table 5.2-12. Hunters' perception of adequacy of access to the OWA.

Response	Percent
Do you feel that access to the Oroville Wildlife Area is adequate?	
Yes	83.2
No	16.8

Source: Hunter Survey.

5.2.3.2 Hunters' Reasons for Choosing to Hunt at OWA

Hunters were asked to describe why they chose to hunt at the OWA rather than other public hunting areas in Northern California (Table 5.2-13). Approximately 28 percent of

respondents indicated the reason was the proximity or location of the hunting area to where they live.

Table 5.2-13. Why hunters chose to hunt at the OWA or other Lake Oroville area.

Reason	Percent
Proximity/location	27.8
Good hunting/habitat	18.6
Good access	16.5
Availability	13.4
Hunting there is free	12.4
Low hunting pressure	10.3
Familiar with the area	10.3
Good chances of getting game	8.2
There for the Junior hunt	7.2
Other	3.1

Note: Respondents' could list more than one reason.
Source: Hunter Survey.

Other reasons respondents gave for choosing to hunt at the OWA or other Lake Oroville areas included the good hunting opportunities and habitat offered (19 percent), as well as easy access to the hunting areas (17 percent of respondents). Approximately 13 percent of respondents chose to hunt at these areas because of the availability of the area, meaning that anyone can hunt there; hunting privileges are not awarded through a lottery, which is the case at some other wildlife refuges. Respondents also visit these areas because they are free (12 percent), not too crowded (10 percent), and because they are familiar with the area and have been going there for several years (10 percent).

5.2.3.3 Perceptions of Hunting Regulations

Hunters were asked if they felt knowledgeable about hunting regulations for Lake Oroville and the OWA, and whether they felt the regulations allowed a quality experience. If the answer to either question was no, they were asked to explain that response.

Almost 90 percent of respondents reported that they were knowledgeable about the regulations for the OWA and Lake Oroville (Table 5.2-14). Of the 10 respondents who reported that they were not knowledgeable about the regulations, half felt that this was due to the regulations not being easily available. Four respondents (20 percent) felt that they did not know about the regulations because the regulations change yearly, and an additional four respondents felt that they did not know the specific regulations for the OWA or Lake Oroville.

Most hunters (85 percent) also felt the hunting regulations for the OWA and Lake Oroville allowed a quality hunting experience, while 15 percent did not. Of the respondents who felt the regulations did not allow a quality experience, nearly 40 percent mentioned opening or closing times. Respondents felt that earlier opening and later closing times were necessary to allow hunters to set up and have a better experience. Other reasons given include low bird populations (23 percent), perceived crowding of the area (15 percent), and a perceived need for more hunting areas around Lake Oroville (7 percent).

Table 5.2-14. Hunters' assessment of hunting regulations within the study area.

Response	Percent
Do you feel knowledgeable about hunting regulations for Lake Oroville and the Oroville Wildlife Area?	
Yes	89.2
No	10.8
Reasons given for lack of knowledge (n=11)	
Regulations not easily available	50.0
Regulations change yearly	20.0
Don't know area specific regulations	20.0
Other	10.0
Do you feel hunting regulations allow a quality experience?	
Yes	85.0
No	15.0
Reasons given for regulations not allowing a quality experience (n=15)	
The opening and closing times are not sufficient	38.0
Bird populations are too low	23.0
The area is too crowded	15.0
Need more hunting areas around the Lake Oroville	7.0
Other	23.0

Source: Hunter Survey.

5.2.4 Hunters' Satisfaction with their Hunting Experience

Hunters were asked to indicate if they were satisfied with their hunting experience and, if not, to explain why. About 75 percent of hunters indicated they were satisfied with their hunting experience. Of the minority who were not satisfied, 57 percent cited lack of birds to shoot or not having taken any birds, and 50 percent indicated that they felt that habitat needed improvement (Table 5.2-15). Respondent dissatisfaction was also related to Afterbay water levels that were too low (21 percent), which they feel hurts habitat for birds and hunting success, inadequate access (14 percent), and other hunters using practices they considered unsafe (14 percent).

Table 5.2-15. Hunters' reasons for dissatisfaction with their hunting experience.

	Percent
Overall, are you satisfied with your hunting experience in the Lake Oroville area and OWA on this trip?	
Yes	75.2
No	24.8
If no…Reasons not satisfied (n=25)	
Lack of birds/did not take any birds	57.0
Habitat needs improvement	50.0
Afterbay water level too low	21.0
Access inadequate	14.0
Other hunters were unsafe	14.0
Other	14.0

Note: Respondents' could provide more than one reason for not being satisfied.
Source: Hunter Survey.

5.2.5 Hunters' Comments on Desired Improvements at the OWA

Hunters were asked to list any improvements they would like to see made at the OWA. Comments related to the need for improvements at the OWA were offered by 80 percent (85 out of 106) of the hunter survey respondents, with some offering more than one comment. A total of 108 comments were collected. Table 5.2-16 shows the percentage distribution of comments that relate to each listed category. Comments are grouped according to one of six potential improvement areas: water levels; park access; facilities and maintenance; wildlife habitat/space to hunt, wildlife populations; and hunting regulations.

Among potential improvement areas, access received the greatest number of suggestions (32 percent of all offered), followed by wildlife habitat/space to hunt (24 percent). However, the single most suggested improvement had to do with making improvements to the natural habitat of game species at the OWA, a request made by nearly one-quarter of all respondents to this question (19 people).

5.2.6 Hunters' Recreation Setting Preferences

In the mailback portion of the Hunter Survey, respondents were asked about their preferences for five various aspects of the recreation setting at the recreation area where they were surveyed. For each aspect, hunters were asked to indicate their preference on a 4- to 7-point scale. Each aspect contributes to the recreational experience at the study area, and included solitude/affiliation, risk and challenge, use of outdoor wilderness skills, presence of the sights and sounds of civilization, and

appearance of the landscape. Together, these items describe a range of recreation settings from primitive, undeveloped and low use to highly developed with high use. Hunting areas are typically characterized by settings toward the undeveloped end of the spectrum.

Table 5.2-16. Hunter's suggested improvements to the OWA.

Comment	Percent
Water levels:	**11.0**
Maintain high water levels in Afterbay	6.0
Maintain consistent water levels	5.0
Access Improvements and Restrictions:	**32.0**
Extend hours of entry	6.0
Improve road conditions & parking	5.0
No improvements/restrict vehicle access	5.0
Install key access at gates	4.0
Improve overall access	4.0
Open for entire duration of archery season	2.0
Permit bicycle access	2.0
Other (4 responses given by 4 hunters)	4.0
Facilities/Maintenance:	**13.0**
Remove litter/add trash bins	5.0
Improve bathroom and cleaning facilities	2.0
Improve boat ramps	2.0
Other (4 responses given by 4 hunters)	4.0
Wildlife Habitat:	**24.0**
Improve natural habitat	22.0
Acquire more land for hunting	2.0
Wildlife Populations:	**15.0**
Stock game species	7.0
Remove animal predators	3.0
Doe tags	2.0
Open limited turkey season	2.0
Close area for 1 year to allow pheasants to increase	1.0
Hunting Regulations:	**9.0**
Increase game warden patrol	4.0
Assign blinds/start areas for hunting	2.0
Limit number of hunters	2.0
Permit use of rifles and handguns during deer season	1.0

Source: Hunter Survey.

Five identical survey questions were asked of general recreation visitors in the OWA within the On-Site Survey portion of the Recreation Visitors Survey. This provides an opportunity to compare hunters' preferences to those of other OWA users. To that end, hunters' responses to each of the five questions are compared to other visitors surveyed within the OWA in the five tables below. In general, hunters expressed a preference for a recreation setting characterized by lower use levels and lower levels of development, while risk and challenge and wilderness skills appear to be less important to them than other OWA users.

Regarding opportunities for solitude and affiliation with others, hunters expressed a substantially greater preference for solitude than other OWA visitors, with about 75 percent of hunters considering solitude "important" to "extremely important" (Table 5.2-17).

Table 5.2-17. Hunters' preference for solitude/affiliation with other groups.

Rating	Hunters (%)	Other OWA (%)
Solitude is extremely important	22.2	14.9
Solitude is very important	22.2	10.5
Solitude is important	**30.6**	28.9
Solitude and affiliation equally important	22.2	**40.4**
Affiliation with other groups is important	2.8	0.9
Affiliation with other groups is very important	0.0	2.6
Affiliation with other groups is extremely important	0.0	1.8

*Note: **Bold** type indicates the most frequent response.*
Sources: Hunter Survey (mailback), On-site Survey.

On the other hand, fewer hunters than other OWA users considered the opportunity to experience risk and challenge and to use wilderness skills important, with most considering these "somewhat important" or "not important" (Tables 5.2-18 and -19). Hunters might have a different conception of the term risk than other area users given the presence of firearms, although challenge would be expected to be important to many hunters.

Table 5.2-18. Hunters' preference for the opportunity to experience risk and challenge.

Rating	Hunters (%)	Other OWA (%)
Extremely important	5.4	24.6
Very important	16.2	15.6
Important	24.3	**29.5**
Somewhat important	**27.0**	15.6
Not important	**27.0**	14.8

*Note: **Bold** type indicates the most frequent response.*
Sources Hunter Survey (mailback), On-Site Survey.

Table 5.2-19. Hunters' preference for the opportunity to use outdoor wilderness skills.

Rating	Hunters (%)	Other OWA (%)
Extremely important	0.0	15.9
Very important	10.8	19.0
Important	21.6	**24.6**
Somewhat important	**37.8**	20.6
Not important	29.7	19.8

*Note: **Bold** type indicates the most frequent response.*
Source: Hunter Survey (mailback), On-Site Survey.

Regarding the sights and sounds of civilization, hunters were somewhat more likely to prefer those sights and sounds to be "rare" or "absent," while very few preferred them to be "common" (Table 5.2-20). Similarly, hunters were somewhat more likely to prefer settings that are "predominantly natural in appearance" and less likely to prefer those that are "modified on a small scale" (Table 5.2-21).

Table 5.2-20. Hunters' preference for the sights and sounds of civilization.

Rating	Hunters (%)	Other OWA (%)
Absent	18.9	15.3
Rare	**48.6**	**38.7**
Unusual	29.7	25.8
Common	2.7	19.4
Dominant	0.0	0.8

*Note: **Bold** type indicates the most frequent response.*
Source: Hunter Survey (mailback), On-Site Survey.

Table 5.2-21. Hunters' preference for landscape appearance.

Rating	Hunters (%)	Other OWA (%)
Totally natural in appearance	18.9	19.0
Predominantly natural in appearance	**67.6**	**53.2**
Modified on a small scale	13.5	27.0
Significantly modified	0.0	0.8

*Note: **Bold** type indicates the most frequent response.*
Source: Hunter Survey (mailback), On-Site Survey.

5.2.7 Hunters' Perception of Management, Water Condition, and User Interaction Issues

The mailback portion of the Hunter Survey asked hunters to indicate whether several management issues were a problem during their visit. The issues presented to hunters

included 16 of the 25 items presented to visitors within the general visitor survey. The eight items not included were primarily boating issues judged to be not relevant to most hunters. In general, most hunters considered most of the management issues to not be a problem during their visit, with 60-85 percent providing that response for all but two of the 16 issues (Table 5.2-22). Two issues were considered to be a "big problem" and four issues were considered to be a "moderate problem" by more than 10 percent of hunters.

Table 5.2-22. Hunters' perceptions of issues as problems during their visit.

Survey Item / Issue	Response			
	Not a problem (%)	A slight problem (%)	A moderate problem (%)	A big Problem (%)
Management				
Litter along the shoreline	15.2	**45.5**	30.3	9.1
Sanitation along the shoreline	**63.3**	20.0	3.3	13.3
Overall safety and security	**84.4**	9.4	6.3	0.0
Availability of service/staffing	**64.0**	28.0	8.0	0.0
Adequate information/warnings provided	**74.3**	14.3	5.7	5.7
Access to the shoreline	**76.5**	11.8	5.9	5.9
Law enforcement presence	**83.3**	6.7	10.0	0.0
Water Conditions				
Floating debris in the water	**75.9**	13.8	3.4	6.9
Quality of water	**77.4**	6.5	12.9	3.2
Water level fluctuations	**53.3**	13.3	13.3	20.0
User Interactions				
Noise from boats and PWC	**67.9**	21.4	3.6	7.1
Boat speed or wake effects	**84.6**	7.7	3.8	3.8
Unsafe behavior by other users	**77.4**	12.9	3.2	6.5
Numbers of people at developed facilities	**60.0**	23.3	13.3	3.3
Use of alcohol by other users	**79.3**	10.3	6.9	3.4

Note: NA not included in calculations or percentages. ***Bold*** *type indicates the most frequent response for each issue.*
Source: Hunter Survey (mailback).

One issue, litter along the shoreline, appears to be considered a larger problem by hunters than the other issues, with about 46 percent considering it to be a "slight problem" and about 30 percent considering it to be a "moderate problem." In comparison, only four other issues were considered to be a "slight problem" by 20 percent or more of hunters, and no more than 13 percent of hunters considered any other issue to be a "moderate problem." About 20 percent of hunters also considered the related issue of sanitation along the shoreline to be a "slight problem," while about 13 percent considered it to be a "big problem." About 28 percent considered another management issue, availability of service/staffing, to be a "slight problem."

Regarding water conditions, hunters expressed the greatest level of concern about the issue of water level of fluctuations, with 20 percent considering this issue to be a "big

problem" (more than any of the other 14 issues). More than half of hunters considered water level fluctuations to not be a problem. Perceptions of this issue being a problem are primarily associated with the Afterbay subunit of the OWA, where fluctuation is considered by some hunters to harm wildlife habitat and hunting success.

Regarding user interactions, the greatest level of concern was expressed about the number of people at developed facilities, with about 23 percent considering it a "slight problem" and 13 percent considering it a "moderate problem." About 21 percent considered noise from boats to be a "slight problem."

5.2.8 Hunters' Opinions of the Adequacy of the Number of Facilities

Similar to the general visitor survey, the Hunter Survey asked hunters to evaluate the adequacy of the number of facilities of specific types. Seven of the 27 items within the general recreation visitor On-Site Survey were selected for inclusion in the Hunter Survey, while 20 items were judged to be not relevant to the OWA.

Regarding camping facilities, opinion appears to have been split regarding the number of campgrounds and screening between campsites between those who consider the number to be "too few" and those who consider the number "about right" (Table 5.2-23). Interest in camping facilities may be low among OWA hunters, with only 16-18 percent of hunters providing an opinion for the three hunting items. Currently, there are only primitive camping facilities in the OWA.

Table 5.2-23. Hunters' opinions on the number of facilities.

Type of Facility	Response		
	Too Few (%)	About Right (%)	Too Many (%)
Camping Related			
Number of campgrounds	**42.9**	**42.9**	14.3
Number of group campsites	16.7	**66.7**	16.7
Screening between campsites	**50.0**	**50.0**	0.0
Boat Related			
Number of boat ramps	14.3	**85.7**	0.0
Number of docks or temporary moorage	33.3	**66.7**	0.0
Fishing/Hunting Related			
Lands for hunting	**68.6**	31.4	0.0
Other			
Number of restrooms	38.5	**61.5**	0.0

Note: NA not included in calculations or percentages. ***Bold*** *type indicates most frequent response.*
Source: Hunter Survey (mailback).

Boating facilities were relevant only to hunters who use the Afterbay subunit of the OWA; thus, only 40 percent of hunters provided an opinion about docks and 55 percent provided an opinion about boat ramps. Few hunters considered the number of boat

ramps to be "too few," while about one-third considered the number of docks or temporary moorage to be "too few." The Larkin Road Car-top Boat Ramp on the Afterbay does not provide a dock for boaters.

More than two-thirds of hunters considered the amount of lands for hunting to be "too few," although most of the OWA, including the Afterbay subunit, is available for hunting during designated seasons. Lastly, about 39 percent considered the number of restrooms to be "too few." Currently, flush toilets are available within the OWA only at the Monument Hill Boat Ramp on the Afterbay, and vault toilets are available at a few sites within the OWA proper.

5.2.9 Hunters' Overall Satisfaction with Experience

The Hunter Survey (mailback), asked hunters to rate the overall satisfaction with their experience at the OWA, using the same 9-point scale as used by respondents to the general visitor Mailback Survey. Responses were converted to numerical scores with "extremely dissatisfied" equal to 1 and "extremely satisfied" equal to 9. Hunters generally rated their satisfaction high, with nearly two-thirds rating their satisfaction as "satisfied" or better (Table 5.2-24). In contrast, less than 11 percent rated their satisfaction as "somewhat dissatisfied" or worse. These responses parallel the 75 percent of hunters who said they were satisfied within the on-site portion of the Hunter Survey (yes/no format question).

Table 5.2-24. Hunters' overall satisfaction.

Level of Satisfaction	Percent
(1) Extremely dissatisfied	0.0
(2) Very dissatisfied	5.4
(3) Dissatisfied	2.7
(4) Somewhat dissatisfied	2.7
(5) Neither satisfied or satisfied	10.8
(6) Somewhat satisfied	13.5
(7) Satisfied	**37.8**
(8) Very satisfied	21.6
(9) Extremely satisfied	5.4
Mean rating	6.5

*Note: **Bold** type indicates the most frequent response.*
Source: Hunter Survey (mailback).

5.2.10 Additional Comments Provided by Hunters

At the end of the Hunter Survey, respondents were given space to write any additional comments they might have had. Nearly 30 percent of the respondents providing a comment mentioned that they had a good experience or believed that management was doing a good job (Table 5.2-25). Twenty-two percent of respondents making an

additional comment mentioned things that management could do to improve hunting opportunities, including: cleaning up or improving habitat and weeds, planting food plots, or stocking more game. Thirteen percent of respondents felt the daily opening time should be earlier to allow hunters to set up or felt there were other regulations that could be changed. Some respondents felt that access could be improved (11 percent), water levels should be higher (9 percent), or more turkey hunting opportunities should be provided (7 percent). A few respondents made comments that mentioned other issues with management (7 percent) or that the area is too crowded (4 percent).

Table 5.2-25. Hunter Survey open-ended additional comments.

Comment	Percent
Had a good experience, think management is doing a good job	29.0
Clean up habitat/weeds/plant food plots/stock more game	22.0
Think opening time should be earlier/other regulations should be changed	13.0
Provide better access	11.0
Water levels should be higher	9.0
Provide more turkey hunting opportunities	7.0
Other issues with management (patrol more, devise a quail management plan, install permanent bathrooms)	7.0
Area is too crowded/problems with other hunters	4.0
Other (shooting area is too dangerous, don't sell the water, keep OWA free of charge to hunt in, more public hunting areas)	13.0

Note: Comments could fit into more than one category.
Source: Hunter Survey.

5.3 SIMILAR SITE SURVEY

The Similar Site Survey was administered at three reservoirs in Northern California deemed similar to the study area in terms of recreational opportunities – Black Butte Lake, Lake Berryessa, and Shasta Lake. All of the questions were contained in an on-site survey booklet similar to the one used in the Lake Oroville area. Most of the questions asked in the Similar Site Survey were identical in content to the questions asked of Lake Oroville areas visitors, and included questions related to a description of their visit to these sites, their perceptions of conditions during the visit, description of past use, and boating experiences.

The new data presented in this section come only from Similar Site Survey respondents. Because one of the primary purposes of the Similar Site Survey was to obtain data that could be used to provide context to data obtained from Lake Oroville area visitors about their perceptions and opinions, responses to each question are compared with data from all Lake Oroville area respondents. Responses to visit and group description questions are compared to identify similarities and differences

between the similar site and Lake Oroville area visitors. Demographic information was also collected for this purpose and is reported in Appendix F.

It is important to reiterate that although the same types of visitors as those contacted at the Lake Oroville area were targeted (boaters, anglers, campers, users of day use picnic and swim areas, trail users), the Similar Site Survey samples were obtained on just one or two summer weekends at each site, as compared to a 12-month period at the Lake Oroville area. As a result, the samples obtained at the similar site reservoirs may not be representative of the overall visitor populations. Also, certain user groups, in particular certain land-based users such as trail hikers and sightseers, comprise a smaller proportion of the survey sample at the similar sites than at Lake Oroville.

The last portion of the Similar Site Survey was directed at Lake Oroville. The first purpose of this section was to learn from those visitors to similar sites who had previously been to Lake Oroville and what their perceptions were of the area. (These questions specifically referenced Lake Oroville rather than the Lake Oroville area to provide the most direct comparison to the similar site reservoirs.) The second purpose was to learn why visitors who had not been to the Lake Oroville area had not visited, and whether certain special events or facilities might motivate them to visit.

5.3.1 Description of Current Visit

To establish a general description of visits to each of the similar sites, respondents were asked to answer questions about the following subjects: length of stay; group size; reasons for visiting the lake at which they were interviewed; activities in which they participated; their primary activity during their visit; and whether or not they were staying overnight.

5.3.1.1 Similar Site Visitors' Length of Stay, Overnight Stays, and Group Size

At all three similar site reservoirs, most visitors were visiting for one to three days (Table 5.3-1). However, larger percentages of Shasta Lake visitors were staying four to seven days (about 29 percent) and more than one week (about 21 percent) than at the other reservoirs, highlighting Shasta Lake's unique status among the group as a major destination type of resource. At Lake Oroville, substantially more respondents (over 60 percent) were one-day visitors only. The average length of stay at Black Butte Lake, Lake Berryessa, and Lake Oroville was between two and three days, whereas at Shasta Lake it was 4.3 days, somewhat higher than the other lakes. Shasta Lake visitors also had the highest median length of stay with three days, while Lake Oroville had the lowest with one day.

Table 5.3-1. Similar site visitors' length of stay.

Length of Stay	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
1 day	40.5	**44.3**	**38.7**	**61.4**
2-3 days	**43.3**	34.0	11.9	20.5
4-7 days	14.9	18.9	29.2	14.0
8-14 days	1.4	1.9	17.4	2.0
>14 days	0.0	0.9	3.3	2.0
	Mean (Median)	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**
Number of days	2.3 (2.0)	2.7 (2.5)	4.3 (3.0)	2.8 (1.0)

*Note: **Bold** type indicates the most frequent response category for each site.*
Sources: Similar Site Survey and On-Site Survey.

Over one-half of Similar Site Survey respondents at each reservoir reported that they had stayed or intended to stay overnight, whereas only 37 percent of Lake Oroville visitors were staying overnight (Table 5.3-2). Differences in the percent of visitors who indicated they were visiting for more than one day and who said they were staying overnight at the similar sites can be attributed to visitors who were not staying at the reservoir, as specified in the survey question, but somewhere else nearby but off-site. (Similar site visitors were not asked to describe their overnight accommodations.)

Table 5.3-2. Overnight visits at similar sites.

Response	Similar Site			Lake Oroville[1] (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Staying overnight	**57.1**	**57.1**	**53.8**	37.0
Not staying overnight	42.9	42.9	46.2	**63.0**

*1. The Lake Oroville area On-Site Survey asked visitors whether they were staying overnight in Butte County, rather than asking if they were staying overnight at Lake Oroville or the Lake Oroville area. However, data on the accommodations used by overnight visitors indicated most were staying at Lake Oroville campsites, on a houseboat, or with family or friends who live locally. **Bold** type indicates the most frequent response for each site.*
Sources: Similar Site Survey and On-Site Survey.

The most common group size at all three similar sites as well as Lake Oroville was two to five people (Table 5.3-3). Six to 10 people was the second most common group size, except at Black Butte Lake where groups of more than 10 members were slightly more common. The average group size was substantially higher at Lake Berryessa (9.5 people) and Black Butte Lake (8.9 people) than at Shasta Lake (6.6 people) or Lake Oroville (6.5 people). Children comprised a similar proportion of visitors' groups at all the sites (about one third).

Table 5.3-3. Similar site group size and composition.

Group Size	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
1 person	0.0	0.9	2.0	10.2
2 – 5 people	**43.2**	**36.0**	**52.5**	**56.1**
6 – 10 people	27.1	35.2	31.6	20.0
More than 10 people	29.7	27.9	13.9	13.7
Mean number of adults	5.6	6.5	4.6	4.4
Mean number of children	3.3	3.0	2.0	2.1
Mean total group size	8.9	9.5	6.6	6.5

*Note: **Bold** type indicates the most frequent response category for each site.*
Sources: Similar Site Survey and On-Site Survey.

5.3.1.2 Reasons for Choosing to Visit Area

Proximity to their homes was the most frequent reason visitors chose to visit Black Butte Lake, Lake Berryessa, and Lake Oroville (Table 5.3-4). At Shasta Lake, the most frequent reason for visiting was familiarity (respondents said they have visited many times) or respondents' considered it their favorite reservoir, while proximity was the second most common reason. Good natural resource conditions at the reservoir (scenery, water quality, size of reservoir, etc.) were also a popular reason for visiting at all sites, but less so at Lake Oroville than the other sites. On the other hand, fishing opportunities were a substantially more prevalent reason for visiting Lake Oroville than the other sites, mentioned by nearly 20 percent of visitors there as compared to just four to eight percent of respondents at the other sites.

5.3.1.3 Similar Site Visitors' Primary Activity

The most popular primary activities varied by reservoir (Table 5.3-5). Swimming was the primary activity of substantially more visitors surveyed at Black Butte Lake than the other sites. Also, the boating activities of motor boating and water-skiing/wake boarding were substantially more prevalent at Lake Berryessa and Shasta Lake than the other sites. PWC use was a more common primary activity at Lake Berryessa than the other sites. At Lake Oroville, unlike at the other sites, the most frequent primary activity was a land-based activity, bank fishing (primarily due to the dominance of this activity on the Feather River). Another activity that was more popular at Lake Oroville than any of the other three reservoirs was boat fishing. These responses correspond with fishing being the second most popular reason for visiting Lake Oroville.

Each of these differences has implications for the data comparing visitor perceptions and opinions, discussed below. Land-based users may have different perceptions and concerns than boaters, and anglers may have different perceptions and concerns than non-anglers.

Table 5.3-4. Similar site visitors' reasons for choosing to visit that place.

Reason	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Proximity to home	**52.5**	**50.0**	25.0	**41.2**
Good facilities/maintenance	20.3	8.8	8.3	9.7
Good natural resource conditions (water quality, scenery, etc.)	10.2	23.5	20.2	13.8
Good social conditions (not crowded, nice people, etc.)	13.6	7.8	3.6	8.7
Boating opportunities	8.5	10.8	4.8	5.7
Swimming or other water-based recreation	6.8	1.0	1.2	4.6
New/change of pace	8.5	11.8	7.1	5.1
Familiar/favorite	3.4	9.8	**26.2**	8.0
Fishing opportunities	5.1	3.9	8.3	19.5
Friends/family there	3.4	4.9	4.8	6.1
Walking, hiking, other land-based activities	3.4	1.0	3.6	7.1
Low cost	3.4	1.0	0.0	3.0
Access	3.4	5.9	0.0	2.0
Boat kept there	0.0	2.0	1.2	2.8
Special event	0.0	2.0	3.6	3.7
Other	1.7	2.0	1.2	1.4

*Note: Respondents could give more than one reason for visiting. **Bold** type indicates the most frequent response for each site.*
Sources: Similar Site Survey and On-Site Survey.

Table 5.3-5. Similar site visitors' primary activity.

Activity	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Swimming	**20.6**	11.0	7.1	11.0
Relaxing	14.7	9.0	16.2	5.8
Water-ski/wake board	11.8	**28.0**	18.2	9.4
Motor boating	8.8	18.0	**19.2**	11.2
Picnicking	7.4	4.0	4.0	2.7
Boat fishing	5.9	6.0	6.1	10.8
Tent camping	5.9	8.0	5.1	3.3
Bank fishing	4.4	0.0	6.1	**16.6**
RV camping	4.4	2.0	6.1	1.8
Hiking	2.9	0.0	0.0	1.7
PWC use	1.5	10.0	6.1	3.8

*Note: **Bold** type indicates the most frequent primary activity for each site.*
Sources: Similar Site Survey and On-Site Survey.

5.3.2 Similar Site Visitors' Past Use of Reservoirs

Similar site visitors were asked about their past use of the reservoirs where they were interviewed. Specifically, they were asked about the number of times they typically visit per year and the season or seasons they had visited the area during the previous 12 months.

5.3.2.1 Frequency of Visits to Similar Sites

At each of the similar site reservoirs, about 44-48 percent of respondents considered themselves to be regular visitors, defined as visiting three or more times per year (Table 5.3-6). At Black Butte Lake and Shasta Lake, the second largest group was occasional visitors (25 percent and 33 percent, respectively), defined as visiting one to two times per year. However, Lake Oroville visitors were much more often regular visitors, with over 68 percent of visitors indicating that they visit the site three or more times per year while just 18 percent were occasional visitors. First-time visitors were a particularly large segment of the visitors surveyed at Lake Berryessa (33 percent) and were 20 percent of Black Butte Lake visitors, as compared to about 12 percent at Lake Oroville.

Table 5.3-6. Similar sites visitors' frequency of visits.

Visitor Frequency	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Regular[1]	**46.7**	**43.6**	**48.0**	**68.1**
Occasional[2]	25.3	18.2	32.7	15.5
Infrequent[3]	8.0	5.5	7.1	4.4
First Visit	20.0	32.7	12.2	11.9

[1] Regular visitor was defined as visiting 3 or more times per year.
[2] Occasional visitor was defined as visiting 1-2 times per year.
[3] Infrequent visitor was defined as visiting less than 1 time per year.
*Note: **Bold** type indicates the most frequent response for each site.*
Sources: Similar Site Survey and On-Site Survey.

5.3.2.2 Similar Site Visitors' Seasons of Visitation

Over 90 percent of respondents at each similar site reservoir visited during the summer (Table 5.3-7). Spring was the next most common season for visits, particularly at Shasta Lake and Black Butte Lake, where about 45 and 36 percent of respondents, respectively, had made spring visits. Lake Berryessa, however, appears to be more of a summer season site with no more than 20 percent of respondents visiting during any season other than summer. About 21 percent and 33 percent of respondents at Black Butte and Shasta Lakes, respectively, visit during the fall. Winter is the season of least visitation at any of the three similar site reservoirs.

The Lake Oroville area, however, had higher percentages of visitors who had visited during the winter, fall, and spring than the other three reservoirs, indicating proportionally more non-peak season and year-round visitors than the similar sites. In this regard, Shasta Lake was most similar to Lake Oroville, with more fall, winter, and spring visitors than the other two similar sites. Winter use at Lake Oroville, in particular, stands out, although it is the season with the fewest visitors at all the sites. At Lake Oroville, 29 percent of respondents visited in the winter versus only about five percent of Black Butte and Lake Berryessa respondents and 16 percent of Shasta Lake respondents. The reason Lake Oroville may have more visitation in seasons other than summer may be due to the popularity of fishing at Lake Oroville and the Feather River, which occurs primarily in the fall and spring. Additionally, many Lake Oroville recreation sites are close to the community of Oroville, encouraging year-round use by local residents.

Table 5.3-7. Seasons similar site visitors had visited area during previous 12 months.

Season	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Spring	36.4	19.6	45.2	52.5
Summer	**93.5**	**92.0**	**98.1**	**85.6**
Fall	20.8	13.4	32.7	45.5
Winter	5.2	4.5	16.3	29.3

*Note: **Bold** type indicates the most frequent response for each site.*
Source: Similar Site Survey and On-Site Survey.

5.3.3 Similar Site Visitors' Perceptions and Opinions

Respondents at the similar sites were asked to provide their perceptions and opinions regarding the following: crowding, scenery, satisfaction, likelihood of their return, management issues at the site, and number of specific types of facilities at the site.

5.3.3.1 Similar Site Visitors' Perceptions of Crowding

Visitors to the similar sites and the Lake Oroville area rated crowding at the location where they were interviewed using a 9-point scale in which 1 meant "not at all crowded" and 9 meant "extremely crowded."

Perceptions of crowding were mostly low at Black Butte Lake and Shasta Lake, with 68 and 60 percent, respectively, providing ratings of "slightly crowded" or less (a rating of 3 or lower) (Table 5.3-8). At Black Butte Lake in particular, more than one-third of those surveyed considered the location where they were to be "not at all crowded." At Lake Berryessa, however, perceptions were more mixed, with just 39 percent rating crowding as "slightly crowded" or less, while 32 percent rated crowding in the middle of the scale

(rating of 4, 5, or 6, with 6 meaning "moderately crowded") and nearly 30 percent rating crowding as worse than "moderately crowded."

Overall, perceptions of crowding at Oroville were comparable to Black Butte Lake and Shasta Lake, with crowding ratings in each third of the scale within a few percentage points of those sites' ratings. However, the 41 percent of Lake Oroville area visitors who considered the site where they were surveyed to be "not at all crowded" was substantially more than at Shasta Lake. The differences in perceptions of crowding were much greater between Lake Oroville and Lake Berryessa, where 27 percent fewer visitors rated crowding as "slightly crowded" or less, while nearly 20 percent more visitors rating crowding as more than "moderately crowded."

Table 5.3-8. Similar site visitors' perceptions of crowding.

Rating	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
1 – Not at all crowded	**36.0**	14.2	18.0	**40.6**
2	13.3	9.4	14.0	11.4
3 – Slightly crowded	18.7	15.1	**28.0**	14.0
4	8.0	7.5	12.0	5.0
5	5.3	2.8	5.0	6.2
6 – Moderately crowded	13.3	**21.7**	13.0	12.3
7	1.3	11.3	7.0	4.1
8	2.7	5.7	2.0	2.2
9 – Extremely crowded	1.3	12.3	1.0	4.3
Mean score	3.0	4.9	3.6	3.2

Note: Ratings refer to the location where respondents were surveyed. ***Bold*** *type indicates the most frequent response for each site.*
Sources: Similar Site Survey and On-Site Survey.

5.3.3.2 Similar Site Visitors' Opinions Regarding Scenery

In addition to crowding, Similar Site Survey respondents were asked to rate the scenery of the survey location. Again, a 9-point scale was used, with 1 equaling a rating of "extremely unappealing" and 9 equaling a rating of "extremely appealing."

The scenery at the similar site reservoirs was most frequently perceived as being "appealing" (a rating of 6), the rating given by 37-43 percent of visitors at each site (Table 5.3-9). Most other visitors at Black Butte Lake and Lake Berryessa rated the scenery one point higher or lower on the scale, while relatively few rated the season as "unappealing" (a rating of 4) or lower. Shasta Lake, however, had the highest number of visitors who felt the scenery to be "extremely appealing" (29 percent), while few gave ratings below 6.

Scenery ratings given by Lake Oroville visitors were somewhat between these extremes, with the largest percentage (32 percent) rating crowding as "appealing," and most others rating crowding one point higher or lower on the scale. Although not as common a rating as at Shasta Lake, the "extremely appealing" rating was given by 17 percent of Lake Oroville visitors. The mean scenery rating for Lake Oroville was 6.3, somewhat higher than the mean rating at Black Butte Lake, about the same as at Lake Berryessa, and somewhat lower than the mean rating at Shasta Lake.

Table 5.3-9. Similar site visitors' rating of scenery.

Rating	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
1 – Extremely unappealing	1.3	0.9	1.0	2.2
2	1.3	0.0	0.0	1.0
3	1.3	0.9	0.0	4.0
4 – Unappealing	9.1	2.8	4.0	4.8
5	16.0	17.6	6.0	14.9
6 - Appealing	**42.7**	**39.8**	**37.0**	**32.0**
7	17.3	19.4	16.0	16.0
8	5.3	4.6	7.0	8.1
9 – Extremely appealing	5.3	13.9	29.0	17.1
Mean Score	5.9	6.4	7.0	6.3

Note: Ratings refer to the location where respondents were surveyed. ***Bold*** *type indicates the most frequent response for each site.*
Sources: Similar Site Survey and On-Site Survey.

5.3.4 Similar Site Visitors' Perceptions of Management Issues

Survey participants at the three similar sites and Lake Oroville were asked to rate several recreation issues related to management responsibilities, water conditions, and user interactions in terms of whether they found each item to be "not a problem," a "slight problem," a "moderate problem," or a "big problem" during their visit.

For purposes of comparison, the percentage of respondents who considered each issue to be a "big problem," as shown in Table 5.3-10, is the focus here. Only a few issues were considered to be a "big problem" by more than 10 percent of respondents at any of the similar sites. While there were no single problems identified by 10 percent or more respondents at Black Butte Lake, and only one at Lake Berryessa (floating debris in the water, by 10 percent of respondents), there were five issues at Shasta Lake that more than 10 percent of respondents felt were a "big problem." These included access to the shoreline (14 percent), cost to use facilities (10 percent), exposed land during low water levels (12 percent), water level fluctuations (12 percent), and noise from boats and PWC (11 percent). For seven of the 10 user interaction issues, the highest percentage of visitors who considered the issue to be a "big problem" was at Shasta Lake, although

for only one of those issues, noise from boats and PWC, was that percentage more than 10 percent.

Table 5.3-10. Visitors' perception of issues at similar sites as being a "big problem."[1]

Survey Item/Issue	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Management				
Access to the shoreline	3.2	8.6	**14.1**	12.6
Adequacy of landscaping of facilities	5.1	**8.9**	4.4	4.2
Adequate information/warnings provided	3.4	3.7	**4.1**	3.2
Availability of service/staffing	4.9	**5.0**	0.0	4.2
Cost to use facilities	3.3	8.8	**10.3**	2.2
Law enforcement presence	3.6	2.9	4.8	**6.2**
Litter along the shoreline	1.6	8.2	0.0	**10.6**
Overall safety and security	0.0	2.5	2.6	**3.2**
Sanitation along the shoreline	1.6	7.4	0.0	**7.8**
Water Conditions				
Exposed land during lower water levels	3.8	8.0	12.0	**27.7**
Floating debris in the water	0.0	10.1	6.9	**11.3**
Quality of water	3.2	**6.2**	4.5	4.2
Shallow areas during lower water levels	3.8	6.8	6.8	**23.6**
Water level fluctuations	0.0	3.9	12.9	**25.9**
User Interactions				
Boat speed or wake effects	3.3	4.1	**7.4**	5.3
Encounters between PWC and other users	3.6	5.5	**9.7**	9.1
Encounters between pleasure boaters & boat anglers	0.0	2.8	3.2	**3.6**
Encounters between trail users & other users	0.0	0.0	0.0	**0.9**
Encounters between water-skiers & others	0.0	2.7	**4.9**	2.9
Noise from boats and PWC	4.8	5.1	**11.6**	5.1
Numbers of people at developed facilities	3.4	2.7	**7.4**	4.2
Numbers of watercraft	3.5	**5.3**	4.4	3.8
Unsafe behavior by others	1.8	6.6	**9.1**	7.3
Use of alcohol by others	1.7	3.8	4.5	**4.8**

[1]Resondents rated issues as "not a problem" , a "slight problem", a "moderate problem", or a "big problem".
*Note: **Bold** type indicates the reservoir at which the greatest percentage considered an issue to be a "big problem".*
N/A responses were not included in calculations.
Sources: Similar Site Survey and Mailback Survey.

At Lake Oroville, however, there were six issues perceived as "big problems" by more than 10 percent of respondents and, in two instances by more than 25 percent of the respondents. Access to the shoreline (13 percent) and litter along the shoreline (11 percent) were the issues related to access and facilities most often identified as "big problems." The remaining issues considered to be "big problems" by more than 10 percent of Lake Oroville visitors were all related to water conditions: exposed land during lower water levels (28 percent), water level fluctuations (26 percent), shallow

areas during lower water levels (24 percent), and floating debris in the water (11 percent). A similar percentage of Lake Berryessa visitors considered floating debris in the water to a be a "big problem" (about 10 percent), while the water level issues were considered to be "big problems" at Lake Oroville by a much greater percentage than at any of the similar sites.

5.3.5 Similar Site Visitors' Opinions on the Number of Facilities Provided

Respondents were asked to indicate their opinion of the number of 20 types of facilities and services at the similar sites and at Lake Oroville. Specifically, respondents were asked to rate the facilities and services as "too few," "about right," or "too many." This discussion focuses on the percentage of respondents who considered each type of facility to be "too few" in number, as shown in Table 5.3-11. In general, most respondents at the similar sites found the number of facilities to be "about right," with the exception of the number of shower facilities at campgrounds at Shasta Lake and the number of fish cleaning stations at Lake Berryessa. These two items were the only items that more than 50 percent of visitors to any of the three sites considered to be "too few" in number. However, while not in the majority, from one third to one half of visitors considered several types of facilities to be "too few" in number at each site. This discussion highlights those facilities that at least one-third of those who expressed an opinion considered to be "too few" in number.

It is important to note that the percentages in the table are based only on those who expressed an opinion about each facility. Visitors were instructed to check the "N/A" response for items they felt did not apply to them; 50 to 75 percent or more of similar site visitors gave that response for most of the facilities listed, with particularly high percentages of such responses for facilities such as floating campsites or equestrian facilities that did not exist at those sites. A majority of similar site visitors did express an opinion about more common types of facilities, such as day use areas along the shore, swim areas, and restrooms.

At Black Butte Lake, 40-46 percent of visitors who expressed an opinion considered the number of floating campsites, screening between campsites, and the number of boat-in gas stations to be "too few." A majority of visitors expressed no opinion about floating campsites (71 percent), screening between campsites (52 percent) or boat-in gas stations (62 percent). About 37-38 percent of Black Butte Lake visitors who expressed an opinion felt there were "too few" campsites with RV hookups, developed day use and picnic areas along the shore, and restrooms. A majority of visitors expressed no opinion about campsites with RV hookups (65 percent) while over 70 percent did express opinions about the other two items.

Table 5.3-11. Similar site visitors' opinions of the number of facilities provided as being "too few."

Facility Type	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Camping				
Number of campgrounds	13.0	20.0	**40.0**	30.9
Number of campsites with RV hookups	37.0	31.7	31.3	**42.4**
Number of floating campsites	40.9	25.9	30.4	**46.7**
Number of group campsites	13.9	22.2	18.8	**38.0**
Number of shower facilities at campgrounds	29.5	46.2	**70.0**	44.6
Presence of campground hosts	8.5	13.5	17.0	**17.3**
Screening between campsites	**45.9**	42.0	36.4	39.9
Boating				
Number of boat ramps	7.1	17.2	24.6	**37.1**
Number of boat-in campsites	21.4	18.8	34.9	**43.6**
Number of boat-in gas stations	**41.4**	16.7	27.6	37.7
Number of boat-in primitive campsites	20.7	16.7	37.5	**42.3**
Number of docks or temporary moorage	22.5	26.2	37.9	**51.6**
Number of marinas	17.1	5.1	17.6	**34.5**
Fishing				
Number of fish cleaning stations	27.3	**51.7**	33.3	46.5
Other Facilities				
Amount of swim areas	14.0	31.8	44.6	**48.3**
Number of dev. day use/picnic areas along shore	37.7	28.8	50.0	**57.1**
Number of equestrian facilities	8.7	15.2	14.3	**30.3**
Number of group picnic sites	17.6	32.7	**39.0**	38.4
Number of interp. programs/educ. opportunities	26.5	17.9	35.3	**45.5**
Number of restrooms	36.7	**49.3**	36.2	40.0

*Note: **Bold** type indicates the reservoir with the highest percentage of visitors responding "too few" for each item. N/A responses were not included in calculations. The number of respondents varies by facility.*
Source: Similar Site Survey and On-Site Survey.

Some of the same types of facilities were among those most often considered "too few" in number by Lake Berryessa visitors, including screening between campsites (42 percent), and number of restrooms (49 percent). As at Black Butte Lake, most visitors expressed no opinion about screening between campsites while about 60 percent did express an opinion about restrooms. The highest percentage of visitors who expressed an opinion (52 percent) considered the number of fish cleaning stations to be "too few" (74 percent expressed no opinion). The number of shower facilities at campgrounds was considered "too few" by 46 percent of Lake Berryessa visitors who expressed an opinion (54 percent expressed no opinion).

Perceptions of needs for more facilities appears to be greater at Shasta Lake than the other similar sites, with 12 of the 20 facilities and services listed considered to be "too few" in number by at least one-third of the visitors who expressed an opinion. Seventy percent considered the number of shower facilities at campgrounds, 50 percent

considered the number of day use areas along shore, and 45 percent considered the number of swim areas to be "too few" (62 percent expressed no opinion about shower facilities at campgrounds while 50 percent of visitors did express an opinion about day use areas along shore and 54 percent expressed an opinion about swim areas). From 33 to 40 percent felt that eight other types of camping, boating, and other facilities were "too few" in number, although 52 to 67 percent of visitors did not express an opinion about most of these items. Most Shasta Lake visitors did express an opinion about the number of docks and the number of restrooms, with 38 and 36 percent, respectively, considering the number present to be "too few."

At Lake Oroville, visitors' opinions of the need for more facilities were more extensive than any of the similar sites, with 17 of the 20 types of facilities and services considered to be "too few" in number by at least one third of those who expressed an opinion. Two types of facilities were considered to be "too few" in number by a majority of those who expressed an opinion: the number of developed day use areas along the shore and the number of docks or temporary moorage. Interest in these facilities is apparently high as a majority of visitors expressed an opinion about them. From 35 to 47 percent of those who expressed an opinion considered the remaining 15 facilities and services to be "too few." However, from 52 to 77 percent of visitors expressed no opinion about most of those items. The exceptions to this were the number of boat ramps, the amount of swim areas, and the number of restrooms, about which from 60 to 82 percent of visitors did express an opinion.

5.3.6 Similar Site Visitors' Satisfaction and Likelihood of Returning to Site

Visitors' satisfaction with their recreation experience at each of the similar survey sites as well as at Lake Oroville was relatively high, ranging from 69 percent satisfaction at Lake Berryessa to 85 percent satisfaction at Shasta Lake (Table 5.3-12). Recreation experience at Lake Oroville was third highest among all sites, with 71 percent of respondents indicating they were "satisfied" to "extremely satisfied" with their recreation experience. Lake Oroville also had the largest percentage of respondents indicating dissatisfaction with their recreation experience (12 percent) as compared to one to eight percent at the similar sites.

Table 5.3-12. Similar site visitors' satisfaction with their recreation experience.

Level of Satisfaction	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Satisfied[1]	**74.7**	**68.9**	**84.7**	**70.6**
Neutral[2]	24.0	23.6	9.2	17.7
Dissatisfied[3]	1.3	7.5	6.1	11.7

[1] Satisfied category includes: "satisfied," "very satisfied," and "extremely satisfied."
[2] Neutral category includes: "somewhat satisfied," "neutral," "somewhat dissatisfied."
[3] Dissatisfied category includes: "dissatisfied," "very dissatisfied," "extremely dissatisfied."
*Note: **Bold** type indicates the most frequent response category for each site.*
Sources: Similar Site Survey and Mailback Survey.

Similar Site Survey respondents were questioned as to how likely they were to return to the survey location, using a 9-point scale where 1 equals "extremely unlikely" and 9 equals "extremely likely" (Table 5.3-13). The most frequent response in each of these sites was "extremely likely," and 58 to 73 percent of visitors to each reservoir considered a return visit to be "very" or "extremely likely." The mean score for each reservoir indicates that a return is between "likely" and "very likely." This question was not asked within the Lake Oroville area surveys.

Table 5.3-13. Similar site visitors' likelihood of returning to the reservoir where surveyed.

Rating	Similar Site		
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)
1 – Extremely unlikely	0.0	2.8	1.0
2 – Very unlikely	3.9	0.9	1.0
3 – Unlikely	1.3	2.8	4.2
4 – Somewhat unlikely	6.6	4.6	0.0
5 – Neutral	5.3	7.4	0.0
6 – Somewhat likely	7.9	6.5	3.1
7 – Likely	17.1	13.0	17.7
8 – Very likely	23.7	21.3	26.0
9 – Extremely likely	**34.2**	**40.7**	**46.9**
Mean Score	7.3	7.4	7.9

*Note: **Bold** type indicates the most frequent response for each site.*
Source: Similar Site Survey.

5.3.7 Boating Sub-section of Similar Site Surveys

Respondents at the similar sites were also asked about their boating experiences while at their respective sites, using many of the same questions as used on the On-Site Survey administered at the Lake Oroville area. Specifically, respondents at the similar

sites were asked about encounters with other visitors in which they perceived they were at-risk; observed activities in which others were placed at-risk; crowding on the water; primary type of watercraft used; use of the boat launches and typical waiting times to use the ramp they used most frequently; and overall satisfaction with their boating experience.

5.3.7.1 Encounters on the Water and Observations of Boating Activity that Respondents Felt Put Them or Other Boaters at Risk

No more than about 10 percent of visitors at the three similar sites reported having an encounter with other users in which respondents felt that they were put at risk (Table 5.3-14). Of those who did have such an encounter at similar sites (less than 10 boaters at each site), the encounters were described as PWC users being unsafe, boaters too close together, or boaters not following general boating safety rules. Ten percent of Lake Oroville boaters also said they had such an encounter during their visit, with similar types of encounters described. Conflicts with PWC were relatively less often described as the cause of the "at risk" encounters at the Lake Oroville area than at the similar sites.

Table 5.3-14. Similar site boaters' encounters on the water that they felt put them at risk.

	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
On this trip, did you personally experience any encounters with other users on the water that put you at risk?				
Yes	6.4	10.2	9.9	9.6
No	**93.6**	**89.8**	**90.1**	**90.4**
If yes…please describe the encounter.				
PWC users being unsafe	**33.3**	**55.6**	**62.5**	**21.9**
Boaters coming too close	0.0	22.2	25.0	21.1
Not following right-of-way, other boating safety rules	**33.3**	0.0	25.0	20.2
Boaters speeding/ignoring no-wake zones	0.0	0.0	0.0	8.8
Other [1]	**33.3**	22.2	25.0	16.6
Unspecified/unclear	0.0	0.0	0.0	11.4

[1] *Includes problems at boat ramp, alcohol use, theft, other undesirable behavior.*
Note: Respondents could list more than one type of encounter. ***Bold*** *type indicates the most frequent response for each site.*
Sources: Similar Site Survey and On-Site Survey.

Compared with their own experiences with unsafe boating behavior, slightly more respondents at two of the three similar sites reported observing boating activities that they felt that put others at risk (Table 5.3-15). About 15 percent of Lake Berryessa and Shasta Lake boaters reported observing such activity (in contrast to just six percent of

boaters at Black Butte Lake). The types of behaviors described were similar to those described as putting the respondent at risk: PWC users being unsafe, boaters too close together, or boaters not following general water safety rules. The 14 percent of Lake Oroville boaters who had observed such activity was about the same as at Lake Berryessa and Shasta Lake. Once again, PWC users were more often described as the source of the unsafe behavior at the similar sites as compared to the Lake Oroville area.

Table 5.3-15. Similar site boaters' observations of boating activities that they felt put others at risk.

	Similar Site			
	Black Butte Lake (%)	**Lake Berryessa (%)**	**Shasta Lake (%)**	**Lake Oroville (%)**
Did you observe any boating activity during this trip that you felt put others at risk?				
Yes	6.4	14.8	14.8	13.6
No	**93.6**	**85.2**	**85.2**	**86.4**
If yes…briefly describe the unsafe activity.				
PWC users being unsafe	**66.7**	**46.2**	**75.0**	18.1
Boaters speeding/ignoring no-wake zones	0.0	23.1	16.7	14.8
Boaters too close together	0.0	15.4	16.7	10.3
Not following right-of-way, other boating safety rules	33.3	0.0	16.7	17.4
Other [2]	0.0	7.7	0.0	**18.7**
Unspecified/unclear	0.0	0.0	0.0	20.6

[1] Includes respondents from the Forebay, Afterbay, and Diversion Pool.
[2] Other activities alcohol use, discourteous behavior, and problems at ramps.
Note: Respondents could describe more than one type of activity. ***Bold*** *type indicates the most frequent response for each site.*
Sources: Similar Site Survey and On-Site Survey.

5.3.7.2 Perceptions of Crowding on the Water

Generally, most respondents did not feel crowded on the water at the similar site reservoirs (Table 5.3-16). Perceptions of crowding were lowest at Black Butte Lake, where about 44 percent of boaters felt "not at all crowded" and nearly 65 percent of boaters felt "slightly crowded" or less while on the water. Perceptions of crowding on the water were somewhat greater at Shasta Lake, where more than half of the boaters considered the reservoir "slightly crowded" or lower on the scale. Perceptions of crowding were more divided at Lake Berryessa, with nearly 49 percent of boaters feeling "slightly crowded" or less (ratings of 3 or lower), about 32 percent feeling "moderately crowded" (ratings of 4 to 6), and about 20 percent feeling more than "moderately" and up to "extremely crowded." The mean crowding rating was also highest at Lake Berryessa, with a mean rating of 4.2 as compared to 3.8 at Shasta Lake and 2.9 at Black Butte Lake.

Lake Oroville boaters' perceptions of crowding were most comparable to Black Butte Lake in terms of the percent of respondents that felt "not at all crowded" to "slightly crowded" (about 67 percent of respondents at Lake Oroville versus about 65 percent at Black Butte Lake). The mean crowding rating of 3.2 is slightly higher than at Black Butte Lake, but about half a point lower than at Shasta Lake and a full point lower than at Lake Berryessa.

Table 5.3-16. Similar site boaters' perception of crowding on the water.

Crowding Rating	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
1 – Not at all crowded	**44.1**	**21.2**	15.3	**30.1**
2	8.8	12.1	8.3	15.4
3 – Slightly crowded	11.8	15.2	**27.8**	21.0
4	5.9	4.5	13.9	6.5
5	5.9	6.1	11.1	6.5
6 – Moderately crowded	20.6	**21.2**	15.3	14.5
7	2.9	7.6	4.2	3.1
8	0.0	4.5	1.4	1.2
9 – Extremely crowded	0.0	7.6	2.8	1.7
Mean crowded rating	2.9	4.2	3.8	3.2

Note: Peak season weekend crowding responses at Lake Oroville were used to better match the timing of Similar Site Survey; data includes ratings for Forebay, Afterbay, and Diversion Pool). ***Bold*** *type indicates the most frequent response for each site.*
Sources: Similar Site Survey and On-Site Survey.

5.3.7.3 Primary Boat Type Used by Similar Site Boaters

The majority of respondents – between 74 and 90 percent – from all three similar site reservoirs primarily use a runabout / ski boat / pontoon boat / cabin cruiser (Table 5.3-17). Personal watercraft were the primary watercraft of the second largest percentage of respondents at each of the similar sites (between 7 and 19 percent) and were especially prevalent among Lake Berryessa boaters surveyed. To a lesser degree, the runabout / ski boat / pontoon boat / cabin cruiser was the primary watercraft category of the majority of Lake Oroville respondents as well, with 67 percent of boaters using those types of boats. PWC were the second most popular primary watercraft at Lake Oroville as well (11 percent). However, houseboats were much more frequently used as a primary watercraft by the Lake Oroville boaters surveyed (9 percent) than at any of the similar sites. Houseboats were present at Lake Berryessa and Shasta Lake, but the limited sampling reduced the opportunity for those boaters to be included in the survey sample.

Table 5.3-17. Primary watercraft type used by similar site boaters.

Watercraft Type	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Runabout/Ski boat/Pontoon boat/Cabin cruiser	**78.1**	**73.6**	**90.4**	**66.9**
Houseboat	0.0	0.0	1.4	8.9
Sailboat	3.1	2.8	0.0	1.9
Canoe/kayak	6.3	0.0	0.0	3.8
PWC (jet-ski, wave runner, etc.)	9.4	19.4	7.4	11.1
Other [1]	3.1	4.2	0.0	7.4

[1] Other included fishing boat, bass boat, jet boat, etc.
*Note: **Bold** type indicates the most frequent response for each site.*
Sources: Similar Site Survey and On-Site Survey.

5.3.7.4 Similar Site Boaters' Use of Launch Ramps and Typical Waiting Time

At least two-thirds of respondents at each of the similar sites, including 90 percent of Shasta Lake respondents, had used one of the boat ramps at the reservoir where they were surveyed (Table 5.3-18). Of the respondents who indicated that they had used boat launches at any of the three reservoirs, only 25 percent of Black Butte respondents reported having had to wait to use the ramp, compared to about 45 percent of Lake Berryessa and Shasta Lake respondents. Black Butte Lake respondents that did have to wait had the shortest waiting time, with an average of 6 minutes. Shasta Lake respondents on average waited 10 minutes, and Lake Berryessa respondents waited the longest, on average, with 14 minutes.

Table 5.3-18. Similar site boaters' use of boat ramps and waits to use launch.

	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Have you ever used one of the boat launches at (the lake surveyed)?				
Yes	**68.1**	**67.0**	**90.1**	**92.4**
No	31.9	33.0	9.9	7.6
Do you typically have to wait to use the boat launch you most frequently use?				
Yes	25.0	45.8	45.2	43.0
No	**75.0**	**54.2**	**54.8**	**57.0**
If yes…On average, how many minutes do you have to wait to use the ramp?				
1-5 minutes	75.0	34.6	43.8	37.8
6-10 minutes	12.5	11.6	25.0	36.8
>10 minutes	12.5	53.8	31.2	25.4
Average length of wait	6 min.	14 min.	10 min.	10 min.

1. Survey data for Lake Oroville includes both the peak summer season and non-peak season; response related to waiting to use ramps were similar between the two seasons; data includes responses given by Forebay, Afterbay, Diversion Pool boaters.
*Note: **Bold** type indicates the most frequent response for each site.*
Sources: Similar Site Survey and On-Site Survey.

Over 92 percent of Lake Oroville boaters had used one of the boat ramps, and the 43 percent who said they typically have to wait to use the ramp they use most often was slightly lower than those at Lake Berryessa and Shasta Lake (46 and 45 percent, respectively), but still substantially higher than the rate at Black Butte Lake (25 percent). The average wait time to launch at Lake Oroville (10 minutes) was comparable with that at Shasta Lake (10 minutes), longer than that at Black Butte Lake (6 minutes), and shorter than that at Lake Berryessa (14 minutes).

5.3.7.5 Similar Site Boaters' Overall Satisfaction with Boating Experience

Boaters' overall satisfaction with the boating experience varied widely between the similar sites, ranging from 66 percent satisfied at Black Butte Lake to 89 percent satisfied at Shasta Lake (Table 5.3-19). Satisfaction at Lake Berryessa was between these two levels but closer to Black Butte Lake at 74 percent. The number of dissatisfied boaters surveyed at each reservoir was between two and four boaters.

Of the 34 percent of respondents reporting dissatisfaction with their boating experience at Black Butte Lake, the majority indicated that it was due to water conditions, while crowding and reservoir water level were identified as the primary reasons by dissatisfied respondents at the other two similar sites.

Table 5.3-19. Similar site boaters' satisfaction with boating experience.

Satisfaction	Similar Site			Lake Oroville (%)
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)	
Overall, are you satisfied with your boating experience on this trip to [reservoir]?				
Yes	**66.0**	**73.9**	**88.9**	**88.7**
No	34.0	26.1	11.1	11.3
If no…why not? [1]				
Reservoir too low	0.0	0.0	**50.0**	**46.2**
Boat ramp/launching problems	0.0	0.0	0.0	21.0
Want more or better facilities	0.0	0.0	0.0	11.8
Too crowded on the water	0.0	33.3	0.0	8.4
Water conditions (choppy, dirty, etc.)	**75.0**	0.0	0.0	6.7
Parking inadequate	0.0	0.0	0.0	5.9
Problems with marina	0.0	0.0	0.0	4.2
Hazards in the water	0.0	0.0	0.0	2.5
Other reasons	25.0	**66.6**	**50.0**	6.7

1. Most of the boaters at the similar sites who were not satisfied did not provide a reason; thus, the number of respondents (n) for this question is very small (2 to 4 respondents). ***Bold*** *type indicates the most frequent response/response category for each site.*
Sources: Similar Site Survey and On-Site Survey.

Satisfaction with the boating experience was high at Lake Oroville as well, with 89 percent indicating they were satisfied, as high as at Shasta Lake and considerably

higher than at the other similar sites. As at Shasta Lake, the most frequently cited reason for dissatisfaction was reservoir water level (46 percent), followed by problems launching and/or problems with the boat ramp (21 percent), which were usually related to low reservoir pool levels.

5.3.8 Similar Site Visitors' Perceptions and Opinions Regarding Lake Oroville

Similar Site Survey participants were asked a series of questions regarding their experiences with and perceptions of Lake Oroville. The first question asked whether or not they had ever visited Lake Oroville. Those who had not visited where asked to explain why, and asked if certain special events and facilities would motivate a first visit to Lake Oroville. Those who had visited Lake Oroville were asked how many times they had visited in the past year, how much time had passed since their last visit, and their overall satisfaction with their last trip to Lake Oroville. The questions were asked in reference to Lake Oroville specifically, rather than the Lake Oroville area, to avoid potential confusion on the part of survey respondents about what areas would be included in the Lake Oroville area.

At Black Butte Lake, the similar site closest to Lake Oroville, slightly more than half of the visitors surveyed had been to Lake Oroville. At Lake Berryessa and Shasta Lake, 80 percent and 68 percent, respectively, had not been to Lake Oroville (Table 5.3-20).

Table 5.3-20. Categorization of similar site visitors' as past visitors to Lake Oroville (visitors vs. non-visitors).

Response	Similar Site		
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)
Have you ever visited Lake Oroville?			
No	49.4	**80.4**	**68.3**
Yes	**50.6**	19.6	31.7

*Note: **Bold** type indicates the most frequent response for each site.*
Source: Similar Site Survey.

5.3.8.1 Similar Site Visitors' Reasons for Not Visiting Lake Oroville

The most frequent reason similar site visitor's at all three sites gave for not visiting Lake Oroville was that they did not know enough about Lake Oroville to visit (29 to 41 percent of responses) (Table 5.3-21). Most others said that Lake Oroville was too far away (24 to 27 percent) or they simply had not had the chance to go yet (8 to 29 percent). An additional 19 percent of Shasta Lake visitors and smaller percentages of Lake Berryessa and Black Butte Lake visitors said they did not go to Oroville because they

like the lake where they were surveyed better or did not like conditions at Lake Oroville. (Those who gave these last two types of responses could be assumed to be basing these choices on other than first-hand knowledge of Lake Oroville, since they stated they had never visited the lake before.)

Table 5.3-21. Reasons similar site visitors have not visited Lake Oroville.

Reason	Similar Site		
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)
Do not know about Lake Oroville	**29.4**	**40.5**	**34.6**
Lake Oroville is too far away	23.5	23.8	26.9
Do not like Lake Oroville	0.0	2.4	0.0
Have not had a chance to visit Lake Oroville	**29.4**	14.3	7.7
Like this lake better	5.9	2.4	19.2
Do not like the conditions at Lake Oroville	0.0	7.1	5.9
Do not know	11.8	9.5	3.8

*Note: **Bold** type indicates the most frequent response for each site.*
Source: Similar Site Survey.

5.3.8.2 Similar Site Visitors' Interest in Special Events and New Facilities

Similar site visitors were asked whether special events from a given list would motivate them to visit the Lake Oroville area for the first time (Table 5.3-22). Of the 13 types of events listed, respondents from Black Butte Lake and Lake Berryessa most frequently checked powerboat races (16 and 19 percent, respectively) as an event that would motivate a first visit, while food and beverage festivals were identified by the highest number of Shasta Lake visitors (16 percent). From 10 to 13 percent of Black Butte Lake visitors and 13 to 16 percent of Shasta Lake visitors expressed interest in fishing events, food or beverage festivals, and water-skiing events. Shasta Lake visitors expressed a similar level of interest in fishing events as a motivation for a first visit. The remaining nine events on the list generally elicited substantially fewer positive responses from similar site visitors, with two to six percent of visitors at each site expressing interest.

The Similar Site Survey respondents were also asked whether any of eight types of facilities listed would motivate them to visit Lake Oroville for the first time. Although the facility checked most often, and the order of the top few responses varied by site, three water-oriented facilities on the list elicited the most positive responses at each site: a water park, a floating restaurant, and warm water swimming/beach areas. Visitors at Black Butte Lake and Lake Berryessa also expressed a more moderate level of interest in showers at DUAs, and at Black Butte Lake, child play areas (Table 5.3-23).

Table 5.3-22. Special events (from a given list) that would motivate similar site visitors to visit Lake Oroville for the first time.

Special Event	Similar Site		
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)
Fishing events	11.7	13.4	13.5
Food or beverage festivals	13.0	14.3	**16.3**
Water-skiing events	10.4	16.1	7.7
Powerboat races	**15.6**	**18.8**	9.6
Canoe/kayak events	6.5	5.4	2.9
Living history demonstrations	5.2	2.7	4.8
Mountain bike events	3.9	6.3	3.8
PWC events	3.9	4.5	2.9
Target shooting competition	5.2	5.4	5.8
OHV related special events	3.9	5.4	4.8
Sailing events	3.9	6.3	2.9
Triathlons	2.6	2.7	2.9
Equestrian events	3.9	3.6	1.9

*Note: **Bold** type indicates the special event with the highest percentage expressing interest at each site. Respondents could select more than one event from the list provided.*
Source: Similar Site Survey.

Table 5.3-23. Facilities (from a given list) that would motivate similar site visitors to visit the Lake Oroville area for the first time.

Facility	Similar Site		
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)
Expanded outdoor center/nature/cultural/historic interpretation center	5.2	2.7	4.8
Water park	13.0	**25.0**	17.3
Floating restaurant on Lake Oroville	16.9	16.1	**20.2**
Warm water swimming/beach areas	**19.5**	17.0	13.5
More RV sites for people with disabilities	2.6	7.1	2.9
Showers at DUAs	10.4	12.5	4.8
Child play areas	13.0	9.8	4.8
More full hook-up RV sites	5.2	8.0	2.9

*Note: **Bold** type indicates the facility with the highest percentage expressing interest at each site. Respondents could select more than one facility from the list provided.*
Source: Similar Site Survey.

5.3.8.3 Similar Site Visitors' Recent Visits to Lake Oroville

Overall, similar site visitors who had visited Lake Oroville do not visit that often. Of similar site visitors that had visited Lake Oroville before, over half of those surveyed at Black Butte Lake (58 percent) and Lake Berryessa (52 percent) had not visited within the last year (Table 5.3-24). At Shasta Lake, 39 percent of respondents that had visited Lake Oroville before had not done so within the last year. Of those who had visited Lake Oroville within the previous year, the largest proportion from Lake Berryessa and Shasta Lake had only visited Lake Oroville once (29 and 39 percent, respectively). However, notable percentages of Black Butte Lake and Shasta Lake visitors (18 and 13 percent, respectively, of those who had visited before) were fairly regular visitors to Lake Oroville and had visited four or more times in the past year.

Table 5.3-24. Number of visits similar site visitors made to Lake Oroville within the last year (past visitors only).

	Similar Site		
Number of Visits	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)
0	**57.9**	**52.4**	**38.7**
1	13.2	28.6	**38.7**
2-3	10.5	19.0	9.7
4-10	15.8	0.0	12.8
>10	2.6	0.0	0.0

Note: Respondents include only those that had visited Lake Oroville before. ***Bold*** *type indicates the most frequent response category for each site.*
Source: Similar Site Survey.

From 59 to 67 percent of similar site visitors who had visited Lake Oroville before had visited within the past 12 months (Table 5.3-25). Due to non-response to the previous question, these percentages are somewhat higher than the percentages who said they had made one or more visits in the last year. An additional six to 10 percent at each site had visited Lake Oroville within the last one to two years. However, 28 percent of past visitors at Lake Berryessa and Black Butte Lake and 19 percent of Shasta Lake visitors had not visited for more than two years.

Table 5.3-25. Time since similar site visitors' last trip to Lake Oroville (past visitors only).

Time Period	Similar Site		
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)
Within the last 12 months	59.0	61.1	66.7
1–2 years ago	10.3	5.6	7.4
2–3 years ago	7.7	11.1	7.4
More than 3 years ago	20.5	16.7	11.1
Can't remember	2.6	5.6	7.4

Note: Respondents include only those that responded that they have been to Lake Oroville before.
Source: Similar Site Survey.

5.3.8.4 Similar Site Visitors' Satisfaction with Last Trip to Lake Oroville

Similar site visitors were asked to rate their satisfaction with their last visit to Lake Oroville, using a nine-point scale where 1 meant "extremely dissatisfied" and 9 meant "extremely satisfied." The percentage of similar site visitors who indicated that they were not satisfied with their last visit (responses of "somewhat" to "extremely dissatisfied," corresponding to 1 through 4 on the scale) varied by site, from 11 percent of Lake Berryessa visitors (1 visitor in sample), to 36 percent of Shasta Lake visitors (10 visitors in sample) (Table 5.3-26).

Table 5.3-26. Reasons why similar site visitors were not satisfied with their last visit to Lake Oroville.

Reason	Similar Site		
	Black Butte Lake (%)	Lake Berryessa (%)	Shasta Lake (%)
Overall, were you satisfied with your last trip to Lake Oroville?			
No (somewhat dissatisfied, dissatisfied, very dissatisfied, or extremely dissatisfied)	22.9	10.6	35.6
If not satisfied….Why were you not satisfied?[1]			
Lack of /inadequate facilities	**50.0**	0.0	20.0
Lake level fluctuation/too low	33.3	**100.0**	**40.0**
Undesirable social conditions	16.7	0.0	20.0
Need better fishing/stock lake	0.0	0.0	10.0
Other/No reason given	0.0	0.0	10.0

1. Respondents who had visited Lake Oroville before and who were not satisfied with their last visit included 6 Black Butte Lake visitors, 1 Lake Berryessa visitor, and 10 Shasta Lake visitors.
*Note: **Bold** type indicates the most frequent response for each site.*
Source: Similar Site Survey.

Those who were not satisfied with their last trip primarily mentioned low water levels and the fluctuation of the lake, the only reason given by the Lake Berryessa visitors and

the most frequent reason given by Shasta Lake visitors. Facility issues included not enough facilities (e.g., "need more beaches, sand"), which was the most common reason for dissatisfaction among the Black Butte Lake visitors who were dissatisfied. Shasta Lake visitors also mentioned facility complaints and a few other reasons evenly among the other categories.

5.4 HOUSEHOLD SURVEY RESULTS

The Household Survey consisted of telephone interviews with 100 residents of Butte County, where the study area is located, and 100 residents of each of three other Northern California and Nevada market areas: the Reno (Nevada), Sacramento, and San Francisco Bay areas. Each of the 400 total respondents had to be at least 18 years of age, had to have lived in California or Nevada for at least six months, and had to have participated in outdoor recreation activities at rivers or lakes in Northern California at least three days during the previous year.

Like the Similar Site Survey, Household Survey respondents were asked if they had ever visited the Lake Oroville area (the land and water areas included in the term "Lake Oroville area" were described); different sets of questions were asked for those who had and had not visited the study area. Those who had visited before were asked questions related to past visits and what special events or new facilities might encourage more frequent visits. Those who had never visited were asked why, and if special events and new facilities might motivate them to visit the Lake Oroville area in the future. Both sets of respondents were asked questions about Northern California rivers and lakes they had visited and their preferences for outdoor recreation settings, as well as general demographic questions. Respondent demographics are located in Appendix F.

In total, 62 percent of household survey respondents had visited the Lake Oroville area previously (Table 5-4.1). All but two percent of respondents from Butte County had visited the Lake Oroville area previously. However, only about one-half of respondents from the other market areas had ever visited the Lake Oroville area (slightly less among San Francisco are residents and slightly more among Sacramento area residents).

Table 5.4-1. Household Survey respondents' past visitation to the Lake Oroville area.

	Market Area				
Response	**Total (%)**	**Butte County (%)**	**Reno (%)**	**San Francisco (%)**	**Sacramento (%)**
Have you ever visited the Lake Oroville area?					
Yes	62.3	98.0	50.0	45.0	56.0
No	36.0	2.0	48.0	50.0	44.0
Not sure	1.8	0.0	2.0	5.0	0.0

Source: Household Survey.

5.4.1 Past Visits and Perceptions of Household Survey Respondents who had Visited Lake Oroville Before

Past visitors to the Lake Oroville area were asked questions regarding the following: frequency of past visits to Lake Oroville; when they had last visited and their level of satisfaction with that visit; if not satisfied, the reason for dissatisfaction; reasons (if applicable) for not visiting Lake Oroville within the past 2 years; any special events and facilities that would motivate more visits to Lake Oroville; and other facilities that respondents would like to see at Lake Oroville.

5.4.1.1 Household Survey Respondents' Frequency of Visits to Lake Oroville Area and Time Since Last Visit

The majority of Butte County respondents (62 percent) reported visiting Lake Oroville three or more times per year while about one-quarter of Butte County respondents reported visiting one to two times per year and only 14 percent reported visiting less than once per year (Table 5.4-2). In contrast, a majority of household respondents from the three other areas (between 63 and 71 percent) reported visiting the Lake Oroville area less than once per year. Thirty percent of respondents from the Reno and Sacramento areas reported visiting one to two times per year. The San Francisco area had the highest percent of respondents outside of Butte County who reported visiting three or more times per year.

Table 5.4-2. Household Survey respondents' frequency of visits to the Lake Oroville area.

Visits Per Year to the Lake Oroville Area	Market Area				
	Total (%)	Butte County (%)	Reno (%)	San Francisco (%)	Sacramento (%)
3 or more times per year	30.5	62.2	4.0	17.8	8.9
1–2 times per year	23.7	23.5	30.0	11.1	28.6
Less than 1 time per year	45.8	14.3	66.0	71.1	62.5

Source: Household Survey.

Almost 88 percent of Butte County respondents had visited the area within the last 12 months (Table 5.4-3). As for residents from the other three market areas, although 34-40 percent had visited within the last 12 months, the largest percentages (40-44 percent) had not visited in the last three years.

Table 5.4-3. Time since Household Survey respondents' last visit to the Lake Oroville area.

Time Since Last Visit	Market Area				
	Total (%)	Butte County (%)	Reno (%)	San Francisco (%)	Sacramento (%)
Within the last 12 months	**56.6**	**87.8**	34.0	40.0	35.7
1–2 years ago	9.2	4.1	14.0	8.9	14.3
2–3 years ago	5.2	3.1	10.0	2.2	7.1
More than 3 years ago	27.3	5.1	**40.0**	**44.4**	**41.1**
Can't remember	1.6	0.0	2.0	4.4	1.8

*Note: **Bold** type indicates the most frequent response for each market area.*
Source: Household Survey.

5.4.1.2 Household Survey Respondents' Satisfaction with Last Visit to the Lake Oroville Area and Reasons for Dissatisfaction

Satisfaction with past visits to the Lake Oroville area, measured using a 7-point scale from "extremely dissatisfied" to "extremely satisfied," was moderately high (Table 5.4-4). The largest percentage of Butte County respondents (about 34 percent) were "very satisfied," and 68 percent were between "somewhat satisfied" and "extremely satisfied" with their last visit. However, over 21 percent said they had been "somewhat" or "very dissatisfied," substantially more than respondents from any of the other market areas.

The largest portion of past visitors from the three other market areas said they were "somewhat satisfied" (40-48 percent), while 34-38 percent were "very" or, less commonly, "extremely satisfied." About 14-20 percent of respondents from each area were neutral in their opinion, while less than four percent were "dissatisfied."

Table 5.4-4. Household Survey respondents' satisfaction with last visit to the Lake Oroville area.

Satisfaction Rating	Market Area				
	Total (%)	Butte County (%)	Reno (%)	San Francisco (%)	Sacramento (%)
Extremely dissatisfied	0.0	0.0	0.0	0.0	0.0
Very dissatisfied	2.4	6.1	0.0	0.0	0.0
Somewhat dissatisfied	8.4	15.3	4.0	4.4	3.6
Neutral	14.9	11.2	20.0	17.8	14.3
Somewhat satisfied	**35.3**	23.5	**40.0**	**40.0**	**48.2**
Very satisfied	29.7	**33.7**	24.0	28.9	28.6
Extremely satisfied	9.2	10.2	12.0	8.9	5.4

*Note: **Bold** type indicates the most frequent response for each market area.*
Source: Household Survey.

There were no respondents from any area that were "extremely dissatisfied" with their last trip, and no respondents from areas outside of Butte County that were less than "somewhat satisfied."

Those who said they were "somewhat," "very," or "extremely dissatisfied" were asked to describe why. Of the dissatisfied respondents from Butte County, 57 percent reported that the pool level fluctuations or low pool level was the reason for their dissatisfaction, and 29 percent reported their dissatisfaction was because of the lack of certain types of facilities (Table 5.4-5). Responses were coded in general categories as listed in the table, and more specific responses are not available. Of the few dissatisfied respondents from areas outside of Butte County (two respondents per area), most were dissatisfied because of a perceived lack of certain facilities, the perception that the area was trashy or not kept up well, or that the setting was too unnatural.

Table 5.4-5. Household Survey respondents' reasons for dissatisfaction with last visit to the Lake Oroville area.

Reason for Dissatisfaction	Market Area				
	Total (%)	Butte County (%)	Reno (%)	San Francisco (%)	Sacramento (%)
Lake level fluctuates/too low	**44.4**	**57.1**	0.0	0.0	0.0
Lack of facilities	29.6	28.6	0.0	**50.0**	**50.0**
Trashy/not kept up	18.5	14.3	**100.0**	0.0	0.0
Too unnatural	7.4	4.8	0.0	**50.0**	0.0
Need better fishing/stock lake	7.4	9.5	0.0	0.0	0.0
Other	18.5	14.3	50.0	0.0	**50.0**

Note: There were 21 respondents from Butte County, and 2 respondents each from the Reno, San Francisco, and Sacramento areas. Respondents could mention more than one reason for being dissatisfied.
***Bold** type indicates the most frequent response for each market area.*
Source: Household Survey.

5.4.1.3 Household Survey Respondents' Reasons for Not Visiting the Lake Oroville Area More Often

Household Survey respondents who had not visited the Lake Oroville area within the last two years (approximately 34 percent of all respondents) were asked why they had not visited more recently. A preference for other places (e.g., Reno area residents preferring Lake Tahoe and Sacramento area residents preferring Folsom Lake, each of which is in or near that market area) was the reason given by the largest percentage of respondents overall and from three of the four market areas (Table 5.4-6).

Personal reasons (too busy, too old, etc.) were generally the second most common category of reasons why Household Survey respondents did not visit the Lake Oroville area more often. After personal reasons, the lack of proximity of their homes to Lake Oroville was the third most frequent response given by Household Survey respondents

as the reason for not visiting. Some others gave a similar reason of preferring to go to places closer to home.

Reasons for not visiting more often that are specific to conditions in the Lake Oroville area in particular were generally few. About 17 percent of San Francisco area and 11 percent of Sacramento area respondents who had not visited in the last two years mentioned generally not liking the conditions or recreation opportunities in the Lake Oroville area. Less than three percent of respondents overall mentioned crowding as a reason for not visiting more often.

Table 5.4-6. Reasons Household Survey respondents have not visited the Lake Oroville area in the last 2 years.

Reason	Market Area				
	Total (%)	**Butte County (%)**	**Reno (%)**	**San Francisco (%)**	**Sacramento (%)**
Prefer other places	**31.8**	**50.0**	**34.6**	17.4	**35.7**
Personal reasons (too busy, too old, etc.)	25.9	12.5	26.9	**26.1**	28.6
Lake Oroville is too far	20.0	0.0	23.1	**26.1**	17.9
Prefer closer places	10.6	0.0	15.4	13.0	7.1
Quality (don't like it)	10.6	0.0	7.7	17.4	10.7
Weather too hot	5.9	12.5	3.8	8.7	3.6
Don't know	3.5	0.0	3.8	4.3	3.6
Have no boat	3.5	25.0	0.0	0.0	3.6
Have a cabin or boat elsewhere	2.4	0.0	3.8	0.0	3.6
Too crowded	2.4	0.0	3.8	0.0	3.6
Nothing there/no reason to go back	2.4	0.0	7.7	0.0	0.0

*Note: **Bold** type indicates the most frequent response for each market area.*
Source: Household Survey.

5.4.1.4 Special Events that Would Motivate Household Survey Respondents to Visit the Lake Oroville Area More Often

Household Survey respondents who had visited the Lake Oroville area were read a list of 14 types of special events and asked if each would motivate them to visit more often. Respondents could also offer their own suggestions.

In general, fishing events received the most positive responses as events that would motivate respondents to visit the Lake Oroville area more often (Table 5.4-7). A fishing event was the type of special event that would motivate the highest percentage of respondents from all but the San Francisco area. Respondents from the San Francisco area responded positively to food/beverage festivals most frequently (26 percent), with fishing events eliciting only slightly less interest (24 percent). Food and beverage festivals were second in popularity among Butte County residents.

Three different types of water-related events (water-skiing, powerboat races, and canoe/kayak or river-related events) were among the top three or four choices or respondents overall and in several of the market areas. From 20 to 28 percent of respondents in three of the four market areas responded positively to each of those type of events.

One additional type of special event received a similar level of positive responses in each market area. Among Butte County respondents, this was living history demonstrations, among Reno area respondents it was mountain bike races, and among Sacramento area respondents it was OHV related events. Some of these types of events also elicited a moderate level of interest (10 to 18 percent positive responses) from respondents in other market areas.

From 16 to 20 percent of respondents from all but the Butte County market area did not respond positively to any of the events on the list, suggesting that special events of any type may not motivate more visits from a minority of past visitors from the more distant market areas.

Table 5.4-7. Special events that would motivate Household Survey respondents to visit the Lake Oroville area more often.

Special Event	Market Area				
	Total (%)	Butte County (%)	Reno (%)	San Francisco (%)	Sacramento (%)
Fishing events	**36.9**	**40.8**	**30.0**	24.4	**46.4**
Food/beverage festivals	24.5	31.6	14.0	**26.7**	19.6
Water-skiing events	23.7	27.6	28.0	11.1	23.2
Powerboat races	22.1	25.5	20.0	13.3	25.0
Canoe/kayak/river-related events	21.7	24.5	20.0	24.4	16.1
Living history demonstrations	15.7	22.4	8.0	6.7	17.9
Mountain bike races	15.3	13.3	24.0	15.6	10.7
PWC events	14.1	17.3	14.0	4.4	16.1
Target shooting competition	13.3	14.3	14.0	13.3	10.7
OHV related events	12.4	14.3	10.0	0.0	21.4
Sailing events	11.6	13.3	10.0	15.6	7.1
Triathlons	10.0	13.3	4.0	11.1	8.9
Equestrian events	8.8	11.2	4.0	8.9	8.9
Other (respondent suggestions)	2.0	2.0	4.0	0.0	1.8
Wake or knee boarding	0.8	2.0	0.0	0.0	0.0
None of the above	13.7	7.1	18.0	20.0	16.1
Don't know	1.2	0.0	4.0	2.2	0.0

Note: Respondents were read a list of the 14 types of special events presented in the table. ***Bold*** *type indicates the special event with the highest percentage of respondents from each area responding positively.*
Source: Household Survey.

5.4.1.5 Facilities that Would Motivate Household Survey Respondents to Visit Lake Oroville Area More Often

Household survey respondents who had visited the Lake Oroville area were also read a list of eight types of facilities and asked if each would motivate them to visit more often. A floating restaurant on Lake Oroville and warm water swimming and beach areas were the two facilities that received the most positive responses (Table 5.4-8). The presence of showers at DUAs was the third most popular facility type, overall, followed by an expanded outdoor center, a water park, and children's play areas.

Of Butte County respondents who have not visited the Lake Oroville area recently (who have visited before but not in the last two years), 50 percent said a floating restaurant would motivate them to visit more often. This was also among the top few facility types receiving positive responses from respondents in the other three market areas. Similarly, warm water beach/swim areas and showers at DUAs were the most popular facility choices at one or two of the market areas and were among the top few choices for the other areas.

Table 5.4-8. Facilities that would motivate Household Survey respondents to visit the Lake Oroville area more often.

Facility	Market Area				
	Total (%)	Butte County (%)	Reno (%)	San Francisco (%)	Sacramento (%)
Facilities on List Read to Respondents					
Floating restaurant on Lake Oroville	**38.6**	**50.0**	22.0	28.9	41.1
Warm water swimming/beach areas	37.8	43.9	24.0	**35.6**	41.1
Showers at DUAs	36.9	39.8	**28.0**	31.1	**44.6**
Expanded outdoor/nature/cultural/ historic interpretation center	30.5	33.7	24.0	22.2	37.5
Water park	29.7	38.8	20.0	15.6	33.9
Children's play areas	27.7	32.7	8.0	26.7	37.5
More full hook-up RV sites	21.7	26.5	12.0	22.2	21.4
More RV sites for people with disabilities	19.3	26.5	4.0	17.8	21.4
Other Facilities Mentioned by Respondents					
Various types of camping sites	4.8	6.1	0.0	11.1	1.8
Marina/boat launching facility	1.6	4.1	0.0	0.0	0.0
More water in the reservoir	1.2	3.1	0.0	0.0	0.0
Restaurants	1.2	2.0	0.0	0.0	1.8
Trails	0.8	0.0	0.0	0.0	3.6
Cabins	0.8	0.0	0.0	0.0	0.0
Other	3.6	5.1	0.0	2.2	5.4
None of the above	14.1	7.1	**28.0**	17.8	10.7
Don't know	1.2	0.0	2.0	2.2	0.0

*Note: **Bold** type indicates the facility with the highest respondent percentage. Respondents could respond positively to more than one type of facility.*
Source: Household Survey.

Several other types of facilities were not the top choice in any area but were among the top three or four in receiving positive responses in three of the four market areas. These facilities include three types of day use areas: an expanded outdoor center/nature/cultural/historic interpretation center, a water park, children's play areas, and one type of campsite, full hook-up RV sites. Each of these types of facilities received positive responses from 20 to 39 percent of respondents in three of the four market areas. RV sites for people with disabilities were also favored by 27 percent of Butte County residents and 21 percent of Sacramento County residents.

About 18 percent of San Francisco area respondents and 28 percent of Reno area respondents said none of the listed facility types would motivate more visits, suggesting that facility additions of any type would not be likely to motivate a minority of residents of those areas to visit.

5.4.2 Reasons Household Survey Respondents had Never Visited the Lake Oroville Area and Interest in Special Events and New Facilities

Only two respondents from Butte County had never been to the Lake Oroville area and were therefore not included in any data presented in this section. The data presented summarize responses given by the 44 to 55 percent of Household Survey respondents from the other three market areas that had not been to the area or were unsure.

5.4.2.1 Reasons for Household Survey Respondents Never Having Visited the Lake Oroville Area

The most frequently given reason, overall, for not having visited Lake Oroville was that the respondent did not know enough about the area (42 percent), followed by lack of proximity to their homes (31 percent) (Table 5.4-9). These were the top 2 reasons given, in that order, by residents of all three market areas. A preference for other lakes was also mentioned by 11-16 percent of respondents in each market area.

Those respondents who had said a preference for traveling to other lakes was a reason for not having visited Lake Oroville were asked which other lakes they preferred to go to. Lake Tahoe and Folsom Lake were particularly popular with respondents from Reno (63 percent) and Sacramento (40 percent), respectively. Each of those lakes is in close proximity to those market area residents. San Francisco area respondents also mentioned Lake Tahoe, along with Lake Berryessa, however two-thirds stated that they preferred to visit other lakes and rivers (Table 5.4-10).

Table 5.4-9. Reasons Household Survey respondents have never visited the Lake Oroville area.

Reason	Market Area			
	Total (%)	Reno (%)	San Francisco (%)	Sacramento (%)
Do not know enough about the area	**41.7**	**44.0**	**50.9**	**27.3**
It is too far away from my home	31.1	42.0	29.1	22.7
Prefer to go to other lakes	12.6	16.0	10.9	11.4
Prefer a different setting	7.9	8.0	10.9	4.5
No time or personal reasons	6.0	0.0	3.6	15.9
Not interested in water-related recreation	5.3	6.0	5.5	4.5
No reason – just have not been	4.0	2.0	0.0	11.4
Too hot there	3.3	8.0	1.8	0.0
Not enough shade trees	2.0	4.0	0.0	2.3
It is not located on a major highway	1.3	2.0	1.8	0.0
Too many people	1.3	2.0	0.0	2.3
Not interested	1.3	2.0	0.0	2.3
Other	4.0	2.0	3.6	4.5
Do not know	1.3	0.0	3.6	0.0

Note: Respondents could give more than one reason for not having visited. ***Bold*** *type indicates the most frequent response for each market area.*
Source: Household Survey.

Table 5.4-10. Other lakes Household Survey respondents prefer to visit.

Other lake prefer to visit	Market Area			
	Total (%)	Reno (%)	San Francisco (%)	Sacramento (%)
Lake Tahoe	**36.8**	**62.5**	16.7	20.0
Folsom Lake	10.5	0.0	0.0	**40.0**
Frenchman Lake	10.5	25.0	0.0	0.0
Lake Berryessa	10.5	0.0	16.7	20.0
Lake Almanor	5.3	12.5	0.0	0.0
Bucks Lake	5.3	12.5	0.0	0.0
Delta rivers or lakes	5.3	0.0	0.0	20.0
Lakes in Plumas Nat. Forest	5.3	12.5	0.0	0.0
Other	36.8	25.0	**66.7**	20.0
Don't know	10.5	0.0	16.7	20.0

Note: Respondents could name more than one lake. ***Bold*** *type indicates the most frequent response for each market area.*
Source: Household Survey.

5.4.2.2 Special Events that Would Motivate Household Survey Respondents to Visit the Lake Oroville are for the First Time

Respondents who had never visited Lake Oroville were asked if there were any special events that might motivate them to visit the Lake Oroville area for the first time. The question was first presented as an open-ended question, and then the respondents were asked to select from a list of possible special events. The open-ended format relies on the respondent to offer their own ideas about special events in the limited time of the interview, and as a result may under-estimate interest in special events. Conversely, the close-ended (response list provided) format may elicit a high number of positive responses that may over-estimate actual interest in the events. Therefore, the results of each format should be balanced against each other.

Approximately 69 percent of all respondents, and 64 to 72 percent of respondents in each market area, were unable to name any special event that would motivate them to visit the Lake Oroville area for the first time or responded that they did not know what type of events they might be interested in (Table 5.4-11). An additional 10 percent of respondents indicated that they would need more information about the area in order to respond about special events.

Table 5.4-11. Special events that would motivate Household Survey respondents to visit the Lake Oroville area for the first time (responses to open-ended format question).

Special Event	Market Area			
	Total (%)	**Reno (%)**	**San Francisco (%)**	**Sacramento (%)**
None / Don't know	**68.9**	**72.0**	**70.9**	**63.6**
Need more information about the area	9.9	6.0	7.3	15.9
Indicated a special event would motivate them to visit for the first time	21.2	22.0	21.8	20.5
Special events mentioned				
Boat and water events	**6.0**	**8.0**	**5.5**	4.5
Concerts	3.3	2.0	1.8	**6.8**
July 4th events and fireworks	2.6	2.0	0.0	**6.8**
Historical and/or cultural exhibits	2.0	0.0	3.6	2.3
Outdoor festivals	2.0	4.0	1.8	0.0
Parades and/or bands	1.3	2.0	1.8	0.0
Contests and pageants	1.3	2.0	1.8	0.0
Animal events	1.3	0.0	1.8	2.3
Off-road, motocross, roller derby	1.3	2.0	1.8	0.0
Camping events	0.7	0.0	1.8	0.0
Children's events	0.7	0.0	0.0	2.3
Fishing events	0.7	2.0	0.0	0.0
Other	0.7	0.0	1.8	0.0

*Note: Respondents provided their own special event ideas. **Bold** type indicates the most frequent responses for each market area.*
Source: Household Survey.

Among the 21-22 percent of respondents in each market area who were able to name at least one type of event, boat and water events were the most frequently named type of events, mentioned by 6 percent of all respondents and five to eight percent in each area. Sacramento area residents mentioned concerts and July 4th events with similar frequency. A variety of other types of events were mentioned, most by one to four percent of respondents in each market area.

When asked to select from a list of special events that might motivate them to visit the Lake Oroville area, "none of the above" or "don't know" remained the most frequent response from respondents in the Reno (30 percent) and San Francisco (40 percent) areas as compared to positive responses to any particular type of special event (Table 5.4-12). However, 60-82 percent of respondents in each area did respond positively to at least one type of special event read to them from the list.

Table 5.4-12. Special events that would motivate Household Survey respondents to visit the Lake Oroville area for the first time (responses to a given list).

Special Event	Market Area			
	Total (%)	Reno (%)	San Francisco (%)	Sacramento (%)
None of the above /Don't know	29.8	30.0	40.0	18.2
Indicated that a special event would motivate them to visit for the first time	**70.2**	**70.0**	**60.0**	**81.8**
Food/beverage festivals	**25.2**	**24.0**	23.6	27.3
Canoe/kayak/river-related events	23.8	18.0	**25.5**	**29.5**
Fishing events	21.9	18.0	20.0	15.9
Powerboat races	19.9	16.0	18.2	25.0
Living history demonstrations	17.2	14.0	10.9	27.3
Water-skiing events	15.2	18.0	18.2	13.6
Target shooting competition	14.6	12.0	14.5	11.4
Mountain bike races	13.2	8.0	12.7	15.9
Equestrian events	9.9	8.0	10.9	11.4
OHV related events	9.3	8.0	7.3	13.6
Sailing events	8.6	8.0	5.5	13.6
Triathlons	8.6	6.0	7.3	13.6
PWC events	7.9	6.0	7.3	11.4

Note: Percentages are percent of respondents, rather than responses. Respondents could select more than one event. ***Bold*** *type indicates the most frequent responses for each market area.*
Source: Household Survey.

Canoe/kayak/river-related events and food and beverage festivals were the most popular type of events among residents of all three market areas, with roughly 20-30 percent of respondents stating that those types of events would motivate a first visit. Fishing events were among the top two or three choices of Reno and San Francisco area respondents, and responded positively to by a similar percentage of Sacramento

area respondents (16 to 20 percent responded positively in each area). Powerboat races were among the top three or four choices in each area, and received a "yes" response from 16 to 25 percent of respondents in each area. Living history demonstrations were a particularly popular choice of Sacramento area respondents, with 27 percent expressing interest. Several other types of events received positive responses from 10-15 percent of respondents in one or more market areas.

5.4.2.3 Facilities that Would Motivate Household Survey Respondents to Visit the Lake Oroville Area for the First Time

Household Survey respondents who had never visited Lake Oroville were asked if there were any outdoor recreation facilities that might motivate them to visit the Lake Oroville area for the first time. As with special events, the question was first presented as an open-ended question, and then the respondents were asked to respond to a list of possible expanded or new facilities.

Approximately 64 percent of respondents at all survey regions were unable to name a recreation facility that would motivate them to visit the Lake Oroville area for the first time, or responded "I don't know" (Table 5.4-13). There was a substantial difference among market areas in this regard, however, with slightly more than half of San Francisco area respondents naming no facilities as compared to 72-73 percent at the other market areas.

Campgrounds were the most frequently mentioned type of facility that would motivate a first visit, and the most frequent response from San Francisco area residents (16 percent) and Sacramento residents (11 percent). Hiking and biking trails were the second most frequently mentioned type of facility overall and the most common response from Reno area residents (10 percent). Facilities related to boating (both motorized and non-motorized) were second most common from San Francisco area residents. Several other types of facilities were mentioned but none by more than five percent of respondents overall.

It should be noted that nearly all of these types of facilities already exist in some form, some in several locations; thus, these responses may chiefly serve to underscore the lack of knowledge of these residents about the facilities available in the study area.

Table 5.4-13. Facilities that would motivate Household Survey respondents to visit the Lake Oroville area for the first time (responses to open-ended format question).

Recreation Facilities	Market Area			
	Total (%)	Reno (%)	San Francisco (%)	Sacramento (%)
None / Don't know	**64.2**	**72.0**	**50.9**	**72.7**
Indicated a facility would motivate a first visit	35.8	28.0	49.1	27.3
Campgrounds	**11.3**	6.0	**16.4**	**11.4**
Hiking, biking trails	7.9	**10.0**	9.1	2.3
Sailing, kayaking, rafting, canoeing, boating, water-skiing, parasailing	6.0	0.0	14.5	2.3
Boat rental, houseboat rental	4.6	6.0	5.5	2.3
Swimming facilities, water park	4.0	4.0	7.3	0.0
RV hookups	3.3	4.0	3.6	2.3
Cabins	2.6	2.0	3.6	2.3
Hotels and restaurants, spa retreat	2.6	0.0	7.3	0.0
Fishing rentals and facilities	2.0	0.0	0.0	6.8
Showers and restrooms	1.3	0.0	1.8	0.0
Game hunting	1.3	0.0	3.6	0.0
PWC Facilities	0.7	0.0	1.8	0.0
Other	2.0	2.0	1.8	2.3

Note: Respondents provided their own facility ideas. ***Bold*** *type indicates the most frequent responses for each market area.*
Source: Household Survey.

When asked to select from a list of eight types of facilities that might motivate them to visit Lake Oroville for the first time, 62 to 76 percent of all respondents said at least one of the facilities would motivate a first visit (Table 5.4-14). A floating restaurant on Lake Oroville was the most popular choice overall, and was also the most popular response among respondents at San Francisco (40 percent) and Sacramento (39 percent). The most frequently identified facility by respondents from the Reno area, aside from none of the above/don't know (38 percent), was warm water swimming/beach areas (34 percent), followed by the floating restaurant (32 percent).

An expanded outdoor/nature/cultural/historic/ interpretation center was the second most popular type of facility overall and the second most popular response from the San Francisco area and Sacramento area residents (36 percent and 32 percent, respectively). A water park facility and showers at DUAs were only slightly less popular facility ideas than the above items and were among the top three choices of one or two market areas.

Table 5.4-14. Facilities that would motivate Household Survey respondents to visit the Lake Oroville area for the first time (responses to a given list).

Facility	Market Area			
	Total (%)	Reno (%)	San Francisco (%)	Sacramento (%)
None of the above/Don't know	30.4	38.0	23.6	29.5
Indicated a facility would motivate a first visit	**69.6**	**62.0**	**76.4**	**70.5**
Floating restaurant on Lake Oroville	**37.1**	32.0	**40.0**	**38.6**
Expanded outdoor/nature/ cultural/historic interpretation center	30.5	24.0	36.4	31.8
Warm water swimming/beach areas	29.8	**34.0**	25.5	25.0
Water park	27.2	24.0	32.7	25.0
Showers at day use areas	25.8	28.0	23.6	25.0
Children's play areas	20.5	16.0	21.8	25.0
More full hookup RV sites	15.2	22.0	10.9	13.6
More RV sites accessible to people with disabilities	13.9	12.0	16.4	13.6

Note: Respondents could respond positively to multiple facilities. ***Bold*** *type indicates the most frequent responses for each market area.*
Source: Household Survey.

5.4.3 Household Survey Respondents' Preferred Recreation Settings and Other Places of Recreation

To better determine the reservoir and river-based recreation use patterns and the preferences of Household Survey respondents, they were asked about Northern California lakes, reservoirs, and rivers they had visited in the previous 12 months and their preferences with regard to recreation setting.

All 400 Household Survey respondents were read of list of 31 lakes, reservoirs, and rivers to respond to and could name up to three additional river and three additional lakes. Lake Tahoe was the most commonly visited lake, reservoir, or river overall and the most commonly visited by Reno area residents (86 percent) (Table 5.4-15). It was also the most commonly visited lake by San Francisco area residents. Not surprisingly, Lake Oroville was the most commonly visited location by Butte County residents (82 percent), but a majority had also visited the Feather River and Sacramento River. While Lake Tahoe demonstrated a strong attraction for respondents from outside of its region, just 12 to 17 percent of respondents in the other market areas had visited Lake Oroville in the previous 12 months.

Table 5.4-15. Visitation to regional lakes, reservoirs, and rivers by Household Survey respondents during the previous 12 months.

Water Body	Market Area				
	Total (%)	Butte County (%)	Reno (%)	San Francisco (%)	Sacramento (%)
Lake Tahoe	**63.5**	45.0	**86.0**	**55.0**	61.0
Sacramento River	**49.3**	**57.0**	29.0	**48.0**	**63.0**
Other Lakes	**33.3**	15.0	33.0	**60.0**	44.0
American River	31.8	9.0	20.0	26.0	**72.0**
Lake Oroville	**31.5**	**82.0**	**12.0**	**15.0**	**17.0**
Feather River	27.0	**61.0**	28.0	8.0	11.0
Folsom Reservoir	27.3	12.0	11.0	17.0	**67.0**
Delta rivers or lakes	24.3	12.0	11.0	39.0	34.0
Shasta Lake	22.8	34.0	13.0	23.0	21.0
Lake Almanor	21.8	42.0	26.0	11.0	7.0
Rivers and lakes in Plumas National Forest	20.5	28.0	34.0	7.0	12.0
South Fork Feather River	19.8	44.0	18.0	4.0	13.0
North Fork Feather River	18.8	48.0	14.0	7.0	6.0
Middle Fork Feather River	16.8	41.0	13.0	6.0	7.0
Other Rivers	16.3	10.0	13.0	24.0	18.0
Yuba River	14.5	12.0	25.0	7.0	14.0
Bucks Lake	14.5	29.0	18.0	5.0	5.0
Rivers and lakes in the Lassen National Forest	14.3	27.0	15.0	4.0	11.0
Lake Berryessa	14.3	10.0	3.0	29.0	13.0
Frenchman Lake	13.5	3.0	**48.0**	0.0	1.0
Eagle Lake	12.8	15.0	24.0	4.0	8.0
Lake Davis	11.8	4.0	**35.0**	5.0	3.0
West Branch Feather River	10.0	31.0	2.0	4.0	3.0
Black Butte Lake	10.0	34.0	1.0	1.0	4.0
Truckee River	9.0	0.0	33.0	1.0	2.0
Antelope Lake	7.0	7.0	19.0	0.0	2.0
Whiskeytown Lake	6.8	17.0	3.0	3.0	4.0
Little Grass Valley Reservoir	5.5	13.0	3.0	4.0	2.0
Trinity Lake	5.0	11.0	3.0	3.0	3.0
Stony Gorge Reservoir	4.0	14.0	0.0	2.0	0.0
Russian River	3.8	1.0	1.0	12.0	1.0
Butt Valley Reservoir	3.5	9.0	1.0	3.0	1.0
Pit River	2.8	4.0	2.0	2.0	3.0
Honey Lake	2.5	3.0	7.0	0.0	0.0
Donner Lake	2.5	1.0	6.0	2.0	1.0
Stampede Reservoir	2.3	1.0	8.0	0.0	0.0
Boca Reservoir	2.0	0.0	8.0	0.0	0.0
Clear Lake	1.8	1.0	1.0	4.0	1.0
Lake Britton	0.5	1.0	1.0	0.0	0.0

*Note: **Bold** type indicates the top three responses for each market area.*
Source: Household Survey.

Strong proximal preferences are apparent in the responses within each region, indicating that respondents tend to visit the water bodies nearest to or in the vicinity of

where they live. Survey respondents from the Sacramento area listed the American River, which runs through the City of Sacramento, as the most visited water body (72 percent). San Francisco area respondents' largest category of attendance was "other lakes" (60 percent), which does not specify which ones they visited, but would likely include the numerous small reservoirs in the San Francisco Bay area.

Household Survey respondents were also asked to indicate their preferred recreation setting from a list of four types. Reno and Sacramento area respondents (55 and 47 percent, respectively) most frequently preferred "natural and undeveloped areas in remote locations near lakes and rivers," which was also the setting most preferred by 46 percent of all respondents (Table 5.4-16). "Developed nature-oriented parks and recreation areas in or near lakes and rivers" (developed areas), which were preferred by 43 percent of all respondents, was the category preferred most by Butte County and San Francisco area respondents (46 and 50 percent of respondents, respectively). "Highly developed parks and recreation areas in or near lakes or rivers," as well as "historical or cultural buildings, sites, or areas" were each mentioned relatively infrequently (by 10 percent or less of respondents) in each market area.

Table 5.4-16. Household Survey respondents' recreational setting preferences.

Setting Type	Market Area				
	Total (%)	**Butte County (%)**	**Reno (%)**	**San Francisco (%)**	**Sacramento (%)**
Natural and undeveloped areas in remote locations near lakes and rivers	**45.8**	37.0	**55.0**	44.0	**47.0**
Developed nature-oriented parks and recreation areas in or near lakes or rivers	42.8	**46.0**	38.0	**50.0**	37.0
Highly developed parks and recreation areas in or near urban areas near lakes or rivers	6.8	9.0	7.0	4.0	7.0
Historical or cultural buildings, sites or areas	4.8	8.0	0.0	2.0	9.0

*Note: **Bold** type indicates the most frequent response for each market area.*
Source: Household Survey.

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6.0 DISCUSSION

The purpose of this section is to: (1) briefly review the numerous survey efforts completed for this study in the context of the survey sampling goals, and (2) summarize the large amount of detailed information presented in the previous Results section to bring forward and highlight the most salient information gained from each survey effort.

6.1 SUMMARY OF SURVEY EFFORTS

The following summarizes the samples obtained during each of the four main survey efforts conducted for this study: the Lake Oroville Area Recreation Visitor Survey, the Hunter Survey, the Similar Site Survey, and the Household Survey. Smaller targeted survey efforts conducted for Study R-16 – *Whitewater and River Boating* and Study R-3 – *Assessment of the Relationship of Project Operations and Recreation* are discussed in those respective study reports. In general, this section demonstrates that the survey efforts for this study were successful in obtaining the samples desired and in meeting sampling goals. The samples obtained are the basis for presenting the survey results as adequate representations of the survey respondents' recreation use, attitudes, opinions, and preferences.

6.1.1 Lake Oroville Area Recreation Visitor Survey

The largest survey effort undertaken for this study, the Lake Oroville Area Recreation Visitor Survey, was conducted over a 12-month period from May, 2002 to May, 2003. The objective of the survey was to obtain information from the full range of recreation visitor types using all portions of the study area during both the summer peak and non-summer non-peak seasons. The survey was successful in obtaining over 2,500 completed On-Site Surveys and over 1,000 completed follow-up Mailback Surveys. The return rate for the Mailback Survey, of about 45 percent, is considered more than adequate and reasonably good for this type of general recreation survey.

Geographically, several hundred On-Site Surveys were obtained from visitors contacted while they used most of the six resource areas that comprise the study area. Lesser numbers of recreationists were contacted at the lightly-used and relatively-undeveloped Diversion Pool resource area, where 62 visitors were surveyed, and the Feather River Low Flow Channel resource area (immediately downstream of the Diversion Pool), where 169 visitors were surveyed at two survey sites selected in the area. Nearly 1,400 visitors were surveyed at Lake Oroville recreation sites; Lake Oroville is the largest resource area, with about half of the recreation sites and as such is the centerpiece of the study area.

Seasonally, over 2,100 surveys were completed by visitors using recreation sites during the May 15 through September 15 summer peak season. Over 450 surveys were

completed by visitors contacted at recreation sites during the fall, winter, and spring seasons (after September 15 and before May 15).

Finally, over 1,300 boaters, over 1,000 anglers, and nearly 1,000 trail users completed the on-site portion of the visitor survey (these groups are not mutually exclusive). Each of these are recreation user groups of special interest to the relicensing Collaborative and area managers. The survey efforts were less successful in contacting the desired number of river boaters. These visitors were found to be very few in number within the study area, and many present entered and exited the study area from outside the area (e.g., from private and downstream launch sites) where it was prohibitively difficult to survey.

6.1.2 Hunter Survey, Similar Site Survey, and Household Survey

The Hunter Survey, Similar Site, and Household Surveys were each conducted concurrent with the larger Recreation Visitor Survey. The objective of the Hunter Survey was to obtain information from this specialized user group on topics specific to hunting in the study area. The objective of the Similar Site Survey was to obtain information from a limited number of recreationists using other regional recreation sites similar to those found within the study area. The data were needed to allow comparison of perceptions of those sites and the study area, and to learn the perceptions of non-visitors of the Lake Oroville area. The objective of the Household Survey was to contact residents of Butte County, the local market for the study area, and three more distant market areas in the region. The data were needed to learn past and potential regional visitors' perceptions of the Lake Oroville area and interest in potential recreation improvements in the area as motivations to visit.

The special Hunter Survey effort, conducted during the fall and winter of 2002-03 within the OWA and Afterbay resource areas, was successful in obtaining over 100 completed On-Site Surveys. A total of 38 hunters returned the follow-up mailback portion of the survey.

The Similar Site Survey effort was, for the most part, successful in meeting the goal of obtaining 100 surveys from visitors at each of the three selected similar recreation site reservoirs (a goal of 300 total completed surveys). In total, 293 surveys were obtained, with the sample falling short of that goal by 24 respondents at the lightest-used of the three similar sites, Black Butte Lake. One-hundred or slightly more surveys were obtained at the other two sites, Lake Berryessa and Shasta Lake.

Lastly, the Household Survey was successful in meeting the quota of 100 completed phone interviews with residents of the local Butte County market area and each of the three more distant Northern California and Nevada market areas. Interview participants were required to be at least 18 years old, to have been residents of the region for at

least six months, and to be participants in outdoor recreation at rivers and lakes in Northern California.

6.2 SUMMARY OF SURVEY RESULTS

The Lake Oroville Recreation Visitor Survey booklet contained 46 questions, and the portion of the follow-up Mailback Survey reported on in this report contained seven questions. Several of these questions contained numerous individual items for visitors to respond to. The resulting survey data-set for each portion of the survey contained hundreds of variables. The large samples obtained, combined with the breadth of the data collected, represent a very large amount of information for the report reader to absorb and assimilate. This section of the report is intended to facilitate understanding of the survey results with an emphasis on the most prominent visitor characteristics, opinions, and preferences.

The primary approach to the survey data analysis and presentation was by geographic area, using the six resource areas within the larger study area. The logic behind this approach is that there are substantial differences in recreation setting, facilities, opportunities, and in some cases management and visitors among resource areas. This summary reflects the basic structure of the data presented in the Results section.

6.2.1 Lake Oroville Area Recreation Visitor Survey Summary

This summary mirrors the more detailed discussion of each major survey topic area as presented in the Results section, with data summarized from both the on-site and mailback portions of that survey effort. The summary makes use of bulleted statements addressing discrete subtopics beneath each major topic area.

6.2.1.1 Description of Recreation Visitors' Use of the Study Area

- Day vs. Overnight Use and Length of Multiple Day Visits: Across resource areas, most Lake Oroville area visitors are day users, with the exception of those at Lake Oroville, where half or more are overnight visitors. The average overnight stay lasted three days (2 nights). Overnight stays are less common during the non-peak season. Most overnight visitors are from outside Lake Oroville's home county, Butte County, and the adjacent counties. Most overnight visitors stay at one of several developed campgrounds on Lake Oroville or on a houseboat, or at primitive camp areas within the OWA.

- Length of Day Visits and Areas Used: One-day visits varied widely in length but typically ranged from three to six hours, on average, depending on the resource area. Most Lake Oroville visitors confined their visit to that reservoir and did not visit other portions of the study area. Similarly, most visitors to other

(downstream) resource areas, such as the Diversion Pool, Forebay, and Afterbay, confined their visits to those areas. Many study area visitors, however, visited different portions of the study area during different visits, and at different times of the year.

- Visitor Group Size and Composition: The size of visitors' groups also varied widely by resource area, ranging from a median size of two at the Diversion Pool and OWA to a median size of seven at the Forebay. Children were usually not a part of groups in the OWA, LFC, and Diversion Pool, while several children were often included in groups using Lake Oroville and the Forebay.

- Visitor Activities: Visitors often participated in several activities while at the study area. Pleasure boating, boat angling, and other water-based activities like swimming and water-skiing predominated at Lake Oroville, along with camping and general shoreline day use. Activities participated in at the Afterbay were similar to those at Lake Oroville, except for camping, and also with special emphasis on PWC use. Trail and shoreline-based day use predominated at the Diversion Pool. Bank fishing, swimming, and shoreline day use predominated at the Forebay. Lastly, bank fishing, fish and wildlife viewing, and general sightseeing were the most dominant activities at the OWA and LFC. Hunting was a dominant use of the Afterbay and OWA during certain fall and winter hunting seasons.

- Frequency and Seasonality of Use: Most study area visitors were regular visitors to the area, recreating there several times per year. Though summer is the peak use season in most resource areas, most areas received considerable fall and spring use and a limited amount of winter use. Non-summer visitors tended to be more locals residents, while more distant areas contributed a larger part of summer visitors.

- Factors in Choosing to Visit: Proximity to home was a dominant reason why most study area visitors recreate there rather than at one of many other similar options on the region. However, features such as desirable natural resource conditions like high water quality and scenery, as well as good facilities and good fishing opportunities, were also important for many.

6.2.1.2 Visitors' Perceptions and Preferences

- Crowding: With the exception of the OWA where anglers may compete for prime fishing spots, few study area visitors were concerned about crowding or considered the areas they used to be crowded to any significant degree. This was true of both the peak season and non-peak season and of both local and non-local ("tourist") visitors.

- Scenery: Visitors rated the natural scenery of the Diversion Pool resource area very highly ("extremely appealing") but typically rated the scenery of other areas as only "moderately appealing."

- Need for Special Events or New Types of Facilities: Few visitors expressed a desire to see more new activities or the facilities to support them made available or for more special events in the area. The greatest interest was expressed for more beach and swim areas.

- Setting Preferences: Study area visitors were interested in enjoying both solitude (being away from other groups) and in having other visitors nearby, although interest in solitude appeared to be stronger. Visitors also expressed a preference for recreation experiences in the Lake Oroville area that provided some degree of risk and challenge and opportunities to use outdoor skills. They expressed a preference for settings in which human-associated sights and sounds are "rare" or "unusual," although some preferred they be "common," as well as a preference for natural appearing landscapes.

- Trail Facilities: Most visitors considered the existing system of hiking, biking, and equestrian trails to be adequate, although there was strong interest in more equestrian trails and better trail signage near the Diversion Pool.

- Camping Facilities: Many visitors felt that developed camping facilities are needed in areas besides Lake Oroville (the Afterbay, Forebay, and OWA). Lake Oroville visitors were most interested in more floating campsites, with a moderate desire for more RV sites, showers, and site screening.

- Boating Facilities: Although some interest was expressed in more boat ramps (primarily related to low summer pool level issues), and less so in marinas, many visitors were interested in having more boarding docks at Lake Oroville and in the availability of fuel for purchase at the Afterbay.

- Fishing and Other Facilities: Diversion Pool, Forebay, and OWA anglers would like fish cleaning stations where none are currently provided. Other prominent perceptions of facility needs include developed day use and shoreline picnic sites at Lake Oroville, Afterbay, and Diversion Pool; swimming areas at Lake Oroville and Afterbay; interpretive facilities at the Forebay and Afterbay; and equestrian facilities at the Diversion Pool.

- Management Issues: The management issue of most concern to Lake Oroville visitors was lack of access to the shoreline. OWA and LFC visitors were most concerned about litter and shoreline sanitation along the Feather River. OWA visitors were also concerned about safety and security and a perceived lack of law enforcement personnel.

- Water Condition Issues: Lake Oroville visitors were concerned about low water levels and shallow areas resulting from reservoir drawdown. Similar concerns were expressed about the Afterbay.

- User Interactions: In general, there was a low level of concern about user interaction issues. Lake Oroville visitors were most concerned about interactions with PWC on the water. OWA visitors were concerned about unsafe behavior, use of alcohol, and overuse of recreation sites.

- Overall Satisfaction: Generally, visitor satisfaction was high, with most visitors indicating that they were "satisfied" or "very satisfied" with the last visit. The Diversion Pool, in particular, stood out as the area where visitors were "very" or "extremely satisfied."

6.2.1.3 Study Area Visitors' Regional Recreation Use

- Use of Other Regional Lakes and Rivers: Many study area visitors had also visited other similar areas in Northern California for recreation within the past year. The most prominent substitutes included Lake Almanor, the San Francisco Bay/Delta, Bucks Lake, Lake Tahoe, Folsom Lake, Shasta Lake, and the Sacramento River.

- Visits to Other Regional Sites as Part of Lake Oroville area Trips: Most Lake Oroville area visitors were visiting only the study area on their trip, and were not including stops at other regional recreation sites.

6.2.1.4 Anglers' Use Patterns, Experiences, and Preferences

- Past Visits and Frequency of Visits: Nearly all study area anglers surveyed were repeat visitors. Many fished in the study area very frequently (more than 10 visits in the past year), but more were infrequent visitors who fished in the area only a few times per year or who had not fished in the area at all in the past year.

- Use of Guides and Participation in Tournaments: Very few study area anglers used the services of fishing guides in the area, and relatively few (generally less than 10 percent) participated in fishing tournaments. (Tournament participants were generally not surveyed while the tournaments were occurring, but may have been included in the survey sample at other times.)

- Crowding: With the exception of anglers in the OWA, anglers were not concerned about crowding while fishing and considered crowding to be slight or

non-existent. In the OWA, however, many anglers considered the areas where they fished to be at least "moderately crowded."

- Species Sought: Lake Oroville anglers were primarily fishing for black bass species, and to a lesser degree for coldwater species like trout and salmon. Diversion Pool anglers fished about equally for bass and trout or salmon. Forebay anglers were primarily fishing for trout while the Afterbay hosted both bass and salmon anglers. OWA and LFC anglers fished predominantly for salmon, trout, and steelhead.

- Fish Caught: Most study area anglers caught at least one fish the day they were surveyed, although about one-third to one-half of anglers in each resource area had not yet caught anything. Those who caught fish typically caught two to five fish, and the average was about three fish caught in most areas. Catch rates were higher at Lake Oroville, where many anglers caught more than 10 fish and the average was seven fish. Overall, black bass were the most frequently-caught species, by a wide margin, followed by salmon. Most bass caught were released, whereas only about a third of the salmon caught were released. Other species caught fairly often were sunfish, catfish, trout, and steelhead.

- Regulations: Most anglers (80-90 percent) felt they were knowledgeable about fishing regulations, and an even greater percentage felt these regulations allowed a quality recreation experience.

- Satisfaction with Fishing Experience: Overall, most anglers (75-90 percent, depending on area) were satisfied with their fishing experience. Those who were not satisfied generally complained of not catching any (or enough) fish or about low reservoir pool levels. OWA anglers pointed to crowding and illegal fishing as additional reasons.

6.2.1.5 Trail Users' Use Patterns, Experiences, and Preferences

- Use History and Primary Type of Trail Use: A high percentage of trail users surveyed (70-80 percent) were repeat trail users. In most resource areas, hiking or walking was the primary type of trail use of most trail users surveyed. In the Diversion Pool area, most were equestrian users. Bike riders were 10-25 percent of users in most areas.

- Crowding: Nearly all trail users considered crowding to be slight or non-existent in all parts of the study area. In the OWA, a moderate degree of crowding was perceived by some, but this related more to unofficial trails accessing the river bank from nearby roads rather than developed trails.

- Encounters on Trails that Threatened Safety: Generally, less than eight percent of trail users in any resource area reported having had an encounter with other trail users that they felt put them at risk that day. However, many of these were described as relating more to animal encounters and motorized use on trails (illegal) or at road crossings, rather than with other hikers or riders. Equestrians using trails in the Diversion Pool area primarily described encounters with bike riders. Other encounters involved equestrians or hikers equally often.

- Condition of Trails: Trail users' satisfaction with the condition of trails was high, with 90 percent or more generally satisfied in each resource area. Those who were not satisfied most often complained about difficulty in reaching shorelines, trailside vegetation, and user conflict issues rather than actual trail conditions. A few users were concerned about related needs of signage, water for horses, and litter removal. Some Diversion Pool users felt the machinery used to grade or maintain trails caused dust and mud problems.

6.2.1.6 Reservoir Boaters' Use Patterns, Experiences, and Preferences

- Areas Boated During Visit: Most Lake Oroville boaters focused their activity on the Main Basin and the South Fork arm of the reservoir. Few boated on the Forebay, Afterbay, or Diversion Pool during the visit. Similarly, most Forebay and Afterbay boaters limited their boating to those areas during the current visit, although a few appeared to take their boat to Lake Oroville also. (Too few Diversion Pool boaters were surveyed to obtain usable data for this section.)

- Crowding: Most Lake Oroville, Forebay, and Afterbay boaters considered the areas where they boated to be "not at all crowded" or, at most, "slightly crowded." A minority group of Lake Oroville and Afterbay boaters considered those water areas to be "moderately crowded."

- At-Risk Encounters on the Water: Less than seven percent of Lake Oroville boaters, less than 13 percent of Afterbay boaters, and less than three percent of Forebay boaters personally had an encounter on the water during their trip that they felt put them at risk. Those who had generally described three types of encounters: boats coming too close or following too close, boaters not observing passing or right-of-way rules or speed restrictions, and PWC behaving recklessly. Boaters occasionally reported observing unsafe boating activity that they felt put others at risk. The types of behaviors described were similar to those listed above.

- Type of Watercraft Used and Ownership: Runabouts, ski boats, and similar powercraft were the predominant types of boats used by boaters surveyed at Lake Oroville and the Afterbay. PWC were the primary watercraft of nearly 30 percent of Afterbay boaters, but were relatively less common on the other

resource areas. Forebay boaters were more diverse, with the largest number of boaters using a runabouts/ski boats, but sailboats, canoes and kayaks, and fishing boats also present. A very high percentage of study area boaters own the boat they use in the area, and most others use a friend's or family member's boat.

- Use of Boat Ramps: Nearly all boaters surveyed use boat ramps in the study area, with the four primary developed ramps at Lake Oroville being most popular with both Lake Oroville and Forebay boaters. Afterbay boaters most often use the Monument Hill Boat Ramp and the Afterbay but are also frequent users of the developed Lake Oroville boat ramps.

- Waits to Use Boat Ramps: More than half of the Lake Oroville boaters surveyed said they typically have to wait to use the ramp they use most often, while most Forebay and Afterbay boaters said they did not typically have to wait. Nearly all of those who said they had to wait reported wait times of 15 minutes or less. Average wait times ranged from nine to 13 minutes, depending on resource area.

- Satisfaction with Boating Experience: From 88 to 91 percent of boaters in each resource area said, overall, they were satisfied with their boating experience during their trip. Those who were not satisfied at Lake Oroville and the Afterbay primarily blamed low water conditions and problems with launching related to low water levels. Forebay boaters had some complaints about ramps, and pointed to a need for more or better facilities.

6.2.2 Hunter Survey

Like the previous section, this section mirrors the more detailed discussion of each major survey topic area as used in the Results section, with data summarized from both the on-site and mailback portions of the Hunter Survey effort. This section makes use of bulleted statements addressing each major topic area.

- Frequency and Seasonality of Use: Most hunters were regular visitors to the Lake Oroville area (three or more visits per year). Their use tended to occur during the fall and winter, although about half also used the area during the spring and summer.

- Length of Stay and Group Size: Nearly all hunters were one-day visitors rather than campers, and most were in the area for just a few hours. Nearly all had arrived in the area before 9 a.m. (and many before 6 a.m.), and most left before noon. Most hunted in groups of two or three, although solo hunters and larger groups were also present.

- Areas used for Hunting and Access: Nearly all hunters confined their visit to the OWA or the Afterbay (managed as a subunit of the OWA). About half said they most often hunt in the Afterbay area, and the remainder favored various other OWA lands and ponds. Over 83 percent considered access to the OWA to be adequate.

- Species Hunted for and Animals Taken: A majority of hunters were hunting for ducks, while 20-40 percent were hunting for geese, pheasant, or quail. Many hunters were hunting for more than one of these types of game. Only a few surveyed hunters were hunting for dove or turkey (during a special restricted hunt) or deer. Duck and turkey hunters were most successful, with about half the duck hunters taking a bird (many took several) and about two-thirds of turkey hunters making a kill. About 44 percent of pheasant hunters took a bird, with most of those taking just one. Less than 30 percent of quail hunters took a bird (generally one or two) and only 12 percent of goose hunters took one or two geese. No dove or deer were reported taken.

- Crowding: Most hunters considered the OWA and Afterbay areas they hunted to be "not at all" to "slightly crowded." However, about a third considered the area "moderately crowded."

- Encounters with Others: Six percent of hunters reported encounters with others that they felt put them at risk. The most common type of such an encounter described was of other hunters "hunting too close."

- Reasons for Hunting in OWA: The most common reasons hunters gave for hunting in the OWA were proximity to their homes, good access and easy availability, good hunting opportunities with light hunting pressure, and lack of user fees.

- Regulations: About 90 percent of hunters felt knowledgeable about hunting regulations for the study area and about 85 percent felt these regulations allowed a quality experience. A few hunters felt the regulations were not easily available. The few hunters who had complaints about regulations most often mentioned opening and closing times as the issue of concern.

- Perceptions of Management Issues: Most hunters did not consider any of 15 management issues to be a problem during their visit, with one exception: most felt litter was a "slight" or "moderate problem" in the area. There was also a notable level of concern about water level fluctuation in the Afterbay, with about one-third of the hunters considering this a "moderate" or "big problem."

- Suggestions for Improvements to OWA: Most hunters offered at least one suggestion for improvements. Although a wide variety of comments were made,

the most common included actions to improve wildlife habitat and otherwise improve game populations, to expand access and improve roads, and to maintain higher and consistent water levels in the Afterbay.

- Satisfaction with Hunting Experience: About three-quarters of the hunters said they were satisfied with their hunting experience. Those who were not satisfied most often blamed a lack of birds, habitat needing improvement, and Afterbay water levels that were too low.

6.2.3 Similar Site Survey

Like the previous sections, this section mirrors the more detailed discussion of each major survey topic area as used in the Results section, with data summarized from the on-site survey used in this survey effort (no mailback survey was used). Once again, this section uses bulleted statements to address each major topic area. The emphasis here is on comparing Lake Oroville visitors' perceptions to those of visitors at the Similar Site Survey reservoirs (Shasta Lake, Black Butte Lake, and Lake Berryessa). The last few topics relate to Similar Site Survey respondents' perceptions of Lake Oroville.

- Comparison of Characteristics with Lake Oroville area visitors: Visitors to the three similar site reservoirs were generally like Lake Oroville area visitors in their recreation use patterns, forming one basis for comparing perceptions between the Lake Oroville area and Similar Site Surveys. However, some substantial differences were identified between Lake Oroville visitors and those at individual similar site reservoirs, which should be considered when making any direct comparisons of opinions or preferences. Similar site visitors were more often day users rather than overnight visitors, and tended to have larger groups. They also generally participated in the same activities as Lake Oroville area visitors and were drawn to the reservoir by its convenience from their homes. Shasta Lake appeared to be somewhat unique from Lake Oroville or the other similar sites in that it is more of a draw for out-of-area tourism, as the largest reservoir in the State and situated on a major Interstate highway.

- Crowding: Perceptions of crowding were somewhat higher at two of the three similar site reservoirs than at Lake Oroville. At Lake Berryessa, in particular, perceptions that crowding was moderate (or worse) were much more common.

- Scenery: Perceptions of the appeal of scenery were lower than at Lake Oroville at Black Butte Lake, about the same at Lake Berryessa, and higher at Shasta Lake.

- Management Issues: Management issues related to access, facilities, and services were generally perceived to be a "big problem" by only a small percentage of visitors at Lake Oroville and the similar sites. However,

perceptions of law enforcement issues and litter/sanitation as a problem were highest at Lake Oroville. Water condition issues (exposed land, shallow areas, and fluctuations) were much more frequently considered a "big problem" at Lake Oroville. On the other hand, most of the several types of user interaction issues were most often considered to be a "big problem" at Shasta Lake.

- Numbers of Facilities: The perceptions that the number of campgrounds and shower facilities at campgrounds as "too few" were highest at Shasta Lake, and were substantially lower at Lake Oroville. However, perceptions that RV hookup sites and group sites were "too few" were highest at Lake Oroville. Regarding boating facilities, with the exception of boat-in gas stations, the perception that several of these types of facilities were "too few" was most common at Lake Oroville. The same was true of several other types of facilities, such as swim areas, developed day use areas along the shore, equestrian facilities, and interpretive programs.

- Satisfaction with Recreation Experience: The percentage of Lake Oroville visitors who said they were "satisfied," "very satisfied," or "extremely satisfied" (about 71 percent) was slightly higher than the percentage similarly satisfied at Lake Berryessa, but slightly lower than at Black Butte Lake and about 14 percent lower than at Shasta Lake.

6.2.3.1 Comparison of Perceptions of Boating Issues

- Boating Encounters: Lake Oroville area boaters and boaters at the similar sites were about equal in reporting encounters on the water that they felt put them at risk and in reporting boating activities that they felt put others at risk. At all sites, PWC encounters tended to dominate the encounters and behaviors described.

- Crowding on the Water: Lake Oroville boaters perception of crowding on the water was substantially lower than the crowding perceptions of boaters at Lake Berryessa or Shasta Lake. It was slightly higher than perceptions of boaters at Black Butte Lake.

- Waits to Launch: The percentage of boaters indicating that they typically had to wait to use the boat ramps at Lake Oroville was slightly lower than at Lake Berryessa and Shasta Lake, but considerably higher than at Black Butte Lake. Average wait times were longest at Lake Berryessa (14 min.) and shortest at Black Butte Lake (6 min.) and about the same at Shasta Lake and Lake Oroville (10 min.).

- Satisfaction with Boating Experience: The percentage of boaters satisfied with their boating experience was about the same at Lake Oroville as at Shasta Lake

(89 percent) but was considerably higher than at either Lake Berryessa (74 percent) or Black Butte Lake (66 percent).

6.2.3.2 Similar Site Visitors' Use and Perceptions of Lake Oroville

- Reasons for Not Having Visited Lake Oroville: Similar site visitors provide three main reasons for not having visited, none of which relate to specific conditions at Lake Oroville: lack of knowledge about the area, distance from their homes, and not having had the chance to go. Less than 10 percent mentioned any negative perceptions of Lake Oroville itself.

- Interest in Special Events at Lake Oroville: About 10-20 percent of the Similar Site Survey respondents said a few types of special events would motivate them to visit Lake Oroville for the first time: fishing events, food or beverage festivals, water-skiing events, and powerboat races. Interest was lower in several other types of events listed on the survey.

- Interest in Facility Additions at Lake Oroville: Interest varied from site to site in new types of facilities that might motivate a first visit to Lake Oroville, but three types of facilities received the most positive responses overall: a water park, warm water swimming/beach areas, and a floating restaurant.

- Visits to Lake Oroville: Among the Similar Site Survey respondents who had visited Lake Oroville in the past, most had not visited in the past year or, in the case of Shasta Lake visitors, had made a single visit. A smaller minority had made several visits during the past year. Many of those who had not been to Lake Oroville in the last year had not been there for more than two years.

- Satisfaction with Last Visit: About 23 percent of Black Butte Lake visitors and 36 percent of Shasta Lake visitors were "somewhat" to "extremely dissatisfied" with their last visit to Lake Oroville. A prominent reason given for not being satisfied was "lake level fluctuation" or "low lake level." Black Butte Lake visitors pointed out a lack of Lake Oroville swimming and shoreline facilities.

6.2.4 Household Survey

The Household Survey consisted of brief telephone interviews with 100 water-based recreationists residing in each of three market areas: Butte County, where the study area is located, Reno (Nevada) area, San Francisco area, and Sacramento area. The following section summarizes responses from two main groups, who were asked different though similar questions: those who had and who had not visited the Lake Oroville area. Nearly all Butte County respondents had been to the Lake Oroville area, as had about 45 to 55 percent of respondents in the other three market areas.

6.2.4.1 Past Visits and Perceptions of Those Who Had Visited the Lake Oroville Area

- Frequency of Visits: As would be expected, Butte County respondents had visited most often, with most having visited the area three or more times per year. Most respondents from the other, non-local market areas visited less often than once per year.

- Time Since Last Visit: Nearly all Butte County respondents had visited the Lake Oroville area within the last 12 months. About 35-40 percent of respondents from the other market areas had also visited within the last 12 months, but 45 to 50 percent had not visited for two or more years.

- Satisfaction with Last Visit: Butte County respondents were most often "very satisfied" with their last visit to the Lake Oroville area and about two-thirds were at least "somewhat satisfied." Satisfaction levels were only slightly lower among residents of the other market areas, with ratings of "somewhat satisfied" more common than ratings of "very satisfied."

- Reasons for Dissatisfaction: Those who were dissatisfied (primarily from Butte County) most often mentioned lake level fluctuation as a reason. Others pointed to perceived facility or maintenance inadequacies. Only two respondents from each of the other market areas were dissatisfied, thus no conclusions can be made.

- Reasons for Not Visiting More Often: Those who had not visited in the last two years were asked to explain why. Most reasons given did not directly relate to conditions in the Lake Oroville area: a preference for other places, a desire to go to places closer to home, and personal reasons. However, about 15 percent of combined respondents mentioned negative perceptions of the Lake Oroville area.

- Interest in Special Events as Motivators to Visit: When read a list of 16 special events as possible motivators to visit the Lake Oroville area more often, more than 20 percent of combined respondents responded positively to five of them: fishing events (37 percent), food or beverage festivals (25 percent), water-skiing events (24 percent), powerboat races (22 percent), and canoe/kayak/river-related events (22 percent). Several others received positive responses from 10-16 percent of combined respondents.

- Interest in Facilities as Motivators to Visit: When read a list of eight types of facility improvements as possible motivators to visit the Lake Oroville area more often, more than 20 percent of combined respondents responded positively to all but one of them. The top three each received about 37-38 percent positive

responses from the combined respondents: floating restaurant on Lake Oroville, warm water swimming/beach areas, and showers at day-use areas.

6.2.4.2 Past Visits and Perceptions of Those Who Had Never Visited the Lake Oroville Area

- Reasons for Never Having Visited: Those who had not visited the Lake Oroville area were asked to explain why. Again, most reasons given did not directly relate to conditions in the Lake Oroville area: a lack of knowledge about the area, distance from their homes, a preference for other lakes, and personal reasons.

- Other Lakes Prefer to Visit: Those who indicated a preference for other lakes were asked to name those other lakes. Respondents in each market area most often mentioned a lake or lakes within or closer to that area: Lake Tahoe for Reno area residents (also mentioned by several San Francisco and Sacramento area respondents), Folsom Lake for Sacramento area residents, and San Francisco area lakes for San Francisco area residents.

- Interest in Special Events as Motivators to Visit: Those who had never visited the Lake Oroville area were read the same list of special events that might serve as a motivator to visit (for the first time, in this case). Although the level of interest was lower than that shown by past visitors, similar types of events received the most positive responses: food and beverage festival (25 percent), canoe/kayak/river-related events (24 percent), fishing events (22 percent), and powerboat races (20 percent). Several others received 13-17 percent positive responses.

- Interest in Facilities as Motivators to Visit: When read the same list of eight types of facility improvements as possible motivators to visit the Lake Oroville area for the first time, more than 20 percent of combined respondents responded positively to six of the eight. The top three each received about 30-37 percent positive responses from the combined respondents: floating restaurant on Lake Oroville (37 percent), expanded outdoor/nature/cultural center (31 percent), and warm water swimming/beach areas (30 percent).

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7.0 REFERENCES

7.1 DOCUMENTS AND LITERATURE CITED

DWR (California Department of Water Resources) and DFG (California Department of Fish and Game). 1983. Agreement Concerning the Operation of the Oroville Division of the State Water Project for Management of Fish and Wildlife. Department of Water Resources, Oroville Field Division. August 16, 1983.

DWR. California Department of Water Resources. 2002. Study R-13 – *Recreation Surveys* Study Plan, Oroville Facilities Relicensing, FERC Project 2100.

DWR. California Department of Water Resources. 2004. Study R-3 – *Assessment of the Relationship of Project Operations and Recreation*, Oroville Facilities Relicensing, FERC Project 2100.

DWR. California Department of Water Resources. 2004. Study R-7 – *Reservoir Boating,* Oroville Facilities Relicensing, FERC Project 2100.

DWR. California Department of Water Resources. 2004. Study R-14 – *Assessment of Regional Recreation and Barriers to Recreation*, Oroville Facilities Relicensing, FERC Project 2100.

DWR. California Department of Water Resources. 2004. Study R-16 – *Whitewater and River Boating*, Oroville Facilities Relicensing, FERC Project 2100.

DWR. California Department of Water Resources. 2004. Study R-18 – *Recreation Activity, Spending, and Associated Economic Impacts*, Oroville Facilities Relicensing, FERC Project 2100.

FERC. 1996. *Recreation Development at Licensed Hydropower Projects*. Volume 12.

Guthrie, Roger, Donald A. Penland, and Edward Seagle. 1997. Lake Oroville State Recreation Area Recreational Use Study. California State University, Chico, CA. August 1997.

NOAA Fisheries. National Oceanic and Atmospheric Administration National Marine Fisheries Service. 2000. *Biological Opinion on Central Valley Project Improvement Act*.

7.2 PERSONAL COMMUNICATIONS

Kastner, A., Hatchery Manager, Feather River Fish Hatchery, California Department of Fish and Game, Oroville, California; personal correspondence with I. Ferguson, Environmental Planner, EDAW, San Francisco, California; July 2003.

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